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Reshaping Management to Keep In Step With the Times

BUSINESS no longer runs along paths of more or less smooth tradition and routine. On the contrary, their progress—their existence even—is beset by a multitude of hazards, most of them unfamiliar and all of them liable, in very short order, to knock the sides out of even the most carefully built organisation.

These Four Factors Are Now Urgently Wanted

To guard against such surprises (as far as it is possible to guard against them) the factors demanded of management can be roughly stated as follows:—

1. Much closer touch with every aspect and activity of the business.
2. A more complete understanding of all its operative factors.
3. Ability to read the significance of these factors in relation to conditions of the moment and those imminent.
4. Ability to make quick, accurate decisions.

Whatever was said in peace time in favour of making quick decisions can be repeated today with at least double emphasis. In peace time the average business had always a certain amount of momentum that would carry it along even if important decisions were not always so accurate or so quick.

Today, the business has no such momentum. It operates, almost literally, from day to day. The



In businesses that are not completely absorbed in Government work the problems of carrying on are many and difficult. New, more modern and "tighter-up" methods of control are essential, especially in smaller businesses that have not the resources of bigger concerns.

Probably the two weakest spots in the average small manufacturing firm are costing and stock control. On these two functions depend wide issues that affect, directly or indirectly, almost every phase of the business from the managerial point of view.

By **J. B. GRAHAM**

North British Rayon Ltd.

controls and restrictions, the injunctions that compel or forbid with which it is hedged round have demanded of the managing executive either that he displays a quite new kind of quality, or that he takes a pretty severe jolt—if no worse.

The businesses I refer to, of course, are those not monopolised by Government contracts for essential war materials. I mean the businesses (and there are hundreds of them) that must peg away on their own initiative and responsibility supplying what they can of their old markets at home and looking for new outlets overseas.

The full-time war contractors are in different case. Behind them are resources that need not enter into immediate consideration. They know few, if any, of the difficulties that beset the manufacturer that must

"stay put."

Among these many businesses that must carry on along their more or less normal lines those that find it most difficult are the small and small-medium size concerns: those employing up to, say, 200 workpeople.

Scientific Management is Not Monopoly Of Big Concerns

By the heads of businesses such as these the term 'scientific management' is often shunned on account of a belief that it necessarily involves great expense. But scientific management is the only thing that today can tighten-up control, make it more vital, cut out time lag and delays, compensate for short or inexperienced staff and generally make the organisation more "alive."

It is not suff

that the small size business must be *proportionately more efficient* than the big concern. This is because the small firm has fewer resources behind it. But it can keep abreast, if not actually ahead of the big concern by means of superior management, by improved co-ordination and closer control.

Whatever the size of a manufacturing business it must provide all the functions necessary to effective trading. It must buy, keep stocks, manufacture, sell, distribute, service customers and so on.

In the small concern the comparatively few persons in the higher management which such an undertaking can afford to maintain must necessarily distribute their time over a variety of functions. Obviously none of these few executives can afford to devote his time to a single function. The result is often a tendency for some duties to be overlooked.

Individuals are naturally inclined to be more interested in one aspect of their work than another. And probably one of the greatest difficulties which faces the small business is that some essential function, say costing, does not receive the full attention necessary for its proper performance.

Competent Outside Assistance Is Of Greatest Help

In difficult times like the present there is a lot to be said in favour of seeking outside advice from a competent consultant.

While it is clearly impossible for the average small business to employ high-grade advice for long periods at high cost it is important that it should have advice of the highest quality. It cannot possess within its own staff the same skilled leadership in all the functions which is enjoyed by larger concerns. But because it cannot employ, say, £2,000 a year management all the time there is not the slightest reason why it should put up with low calibre management all the time. It can use high grade assistance for a shorter time.

The cost of such assistance should never be regarded in the single light of a lump sum out-going. It should always be related to the corresponding yield expressed in terms of reduction in expense.

But while the matter of expert outside assistance is certainly something to be considered executives will find that they must give close and personal attention to the factors listed at the beginning of this article.

For example, means

exactly what it says. The head of the business must, literally, go more into his factory and his offices. He must see for himself what goes on there. He must have an eagle eye for economies.

He can give a good lead, too, in this direction by personally having a word or two here and there with the workers themselves. A word from the boss goes a long way—provided it is the right sort of word.

To this war can be attributed one virtue. It is certainly making people mix; it is breaking down those barriers of caste that in the past

have produced so much friction in industry. The common danger is proving a great equaliser. And I think that's all to the good.

In getting round his factory and office the executive therefore has far better chance than he would have had formerly of getting a really first hand knowledge of what goes on.

In a score of ways the bits of information and experience picked up in such personal association with the practical side of his organisation will help the executive tremendously in his job of forming and carrying out his policies of management.

Money

For the Expansion Of Your Business

By NORMAN CRUMP, City Editor, "Sunday Times"

SINCE the war bank advances have decreased by about £50,000,000 despite the fact that banks are now lending freely for the finance of war production.

Clearly there has been a big change in the nature of bank loans, due partly to the war-time contraction of many forms of activity which used to rely on bank credit.

The character of the new loans is today of greater interest. Some time ago I suggested that our industries needed an adequate supply of working capital, just as much as raw materials, machine tools, or labour. Actually this need has not been overlooked by the ministries of Supply and Aircraft Production. But instead of relying on the normal pre-war sources of new capital, reinforced perhaps by their own guarantee, they are making use of the banks.

How To Apply

The procedure, which perhaps is not known widely enough, is that a manufacturer engaged on war work applies for additional finance first to his local bank manager. In most cases the finance will be readily forthcoming, but if the manager has any doubt he refers the application to his Advance Department at head office in the normal way.

Special sections of the Ministries concerned are in continuous contact with the Advance Departments of all the leading banks. They can at once link up any application for a loan with the contract for which the new finance is required. Equally they make it their business to "vet" the applicant firm from the standpoint of its ability to manage its financial affairs, just as other sections of the Ministry have already vetted the firm's technical ability.

In this way a banker's doubts can often be resolved. But this procedure also raises another very important point, namely, the capacity of each firm's management. The basic rule is that no factory or machine-tool must be allowed to stand idle. Therefore if the management is inefficient, it must be strengthened.

Obviously this is a delicate matter, but war needs must come first. In the last

resort, the Ministry has power to requisition machine-tools or factories—that is, to oust the old management altogether. The better and usual course is either for the Ministry to introduce its own representative or to invite the lending bank to do so. The presence of a new "Watch-dog" of this kind helps to ensure financial stability.

On the other side of the picture, a firm whose war work in growing is enabled to rent additional machine-tools and even factory-space and land. This again gets over the difficulty of raising fresh capital to meet a temporary war need.

War contracts to-day contain a "break" clause. This means that at the end of the war contracts will be terminated gradually and not abruptly, so that a manufacturer and his creditors will not be left high and dry.

All this raises several important points. First, it throws on the Ministries concerned the onerous duty of forming a panel of capable managers, who can be used to strengthen existing businesses on the technical and financial side. Such men must have a high degree of tact as well as the highest professional qualifications.

Next the Ministries are relying entirely on the banks for the provision of the necessary finance. This is an *ad hoc* expedient, for it is not normally a bank's job to provide a customer with more than a certain amount of working capital. From the more general aspect it means that the war industries are obtaining much of their new capital not from accumulated savings, but from an expansion of bank credit.

Less Private Money Available

This is probably inevitable, for the pre-war private sources of capital have largely dried up, and many of the sub-contractors in munitions production are too small to warrant public capital issues, even if the Treasury consented. Yet it means that the expansion of credit due to war goes beyond any direct expansion due to the excess of Government expenditure over tax revenue and borrowing.

Actually one begins to argue round in

MANAGEMENT in the War

Bureaucrazy Uber Alles

WITH animation and pride a Board of Trade official at a recent press conference said that the Government had carried out in a month a Census of Production and Employment among 20 industries before determining the new quotas allowed under the limitation of Supplies Order.

"Usually," said he, "such a census takes two years."

Well, if the job could really be done in a month it doesn't say much for the procedure that formerly occupied two years. But bureaucrats rush in where business men might fear to tread—with the inevitable result. The series of quotas rushed through in a month bear little relationship to the production quotas of the factories affected.

Manufacturers have to work ahead, sometimes many months ahead. They therefore had to make "intelligent guesses" at the unpredictable decisions of Whitehall. They anticipated quotas similar to those enforced previously. When the new quotas, drastically cut, were announced however, many firms found they had seriously over-produced.

Any office boy could have told the Board of Trade that it is useless to announce a quota to manufacturers at a notice of a few weeks. At best it is silly and wasteful; at worst, it is ruinous.

The B.O.T. man *did* say that the Government realised the position and that the next quota list will be issued "in good time." But so did the Government back in the summer tell the people of Southern England that, come winter, plenty of coal would be on hand. The bureaucrat's idea is not the same as the business man's idea of getting something done "in good time."

ONE small help to manufacturers is that the Government will allow them to distribute stock to "warehouses" in any part of the country. That'll allow some clearance of stock-rooms at the factory. But on no account must the goods be distributed and invoiced to dealers in anticipation of the next quota period.

Censor Your House Organs

DON'T help the enemy by publishing bulletins about former members of your staff now in the Services.

This, in effect, is the warning given recently in Chatham Garrison Orders.

The order says that a number of firms have been writing to past employees, now in the Army, asking for



details of their activities.

"This information is often collated and circulated in the form of bulletins, house organs or news letters to past and present employees.

"Although the motives of these firms are not questioned, and it is understood that members of a firm should wish to keep in touch with each other, such bulletins constitute a dangerous source of leakage of information, and would be of value to the enemy if they fell into the wrong hands.

"In future only the very briefest information is to be given, and this must be submitted by a soldier to his commanding officer before it is forwarded to the firm."

Editors or other executives responsible for house organs, etc., must exercise particular vigilance to see nothing is published that may help to identify the location or activities of any unit of H.M. Forces.

The New Factory Lighting Standards

THIS paper has consistently advocated planned, scientific lighting for all factories and offices. Good lighting means better work at less cost: less cost in personnel as well as

materials. The recent official Order requiring a new standard of lighting (6 foot-candles at 3 ft. above floor level) to be maintained has, however, met with a certain amount of criticism. Some firms have objected to the expense it will involve.

We shall be glad to hear from any reader who has views to express on this important matter.

Incidentally, firms wishing to make representations concerning the Order should do so to the Ministry of Labour and National Service, Factory and Welfare Dept., Cleland House, Page Street, Westminster, S.W.1.

Firms engaged on vital National work can obtain a subsidy of 35 per cent. towards the cost of the installation, or of improving the lighting.

Reorganizing Staff A.R.P. Duties

INTENSIFIED work in the winter black-out, the calling up of men, the increased bombing and the great number of A.R.P. duties makes a demand for the reconsideration of workers' A.R.P. duties and their remuneration.

Overtime in factories is, of course, paid for, at increased rates. A.R.P. work in overtime is normally not paid for: the voluntary principle being maintained in most cases.

A.R.P. work is beginning to demand specialists who must be kept on the job. What is the difference between a fire-watcher and a night watchman? Can a man do a good day's work and do voluntary A.R.P. duties every other night week after week? Is not one night in eight enough?

The solutions to the problem will be different for each firm.

One company proposes to ascertain the voluntary duties, whether externally or internally, of each employee. It will be suggested to some they cut down voluntary work when it is interfering with production. To others it will be suggested that the times now demand that they begin or do more. When this has been done, it will be possible to assess the man and woman power available and to reorganise times and payments as necessary. Many companies have had to engage men for duties which are and can be performed voluntarily elsewhere.

Waste Paper : What About It ?

MANY firms are complaining that the initial drive shown by the authorities over the salvage of waste

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Seven Rules for Making Dilution Work

The "Dilution of Labour" means the bringing in of new, unskilled workers to replace semi-skilled employees called up to the Forces or who move up to do more skilled work. Today, with the shortage of male labour and the need for still bigger production this policy is vital in the National interest

IF dilution is to be successful management must adopt certain policies and lines of action designed to cope with this specific problem. Detailed plans as well as broad policies are necessary to avoid the many difficulties of dilution other than those raised by Government and other official regulations.

One of the successful schemes to make dilution work is that practised by a large engineering firm in the Midlands. The head of this company has personally directed the scheme. This is how he describes it:—

Seven Rules For A Successful Plan

We normally have about fifteen hundred employees but since the war started we have taken on many more. For us, dilution has been imperative and a good deal of management time has been devoted to solving the many difficulties bound up in the problem.

As the result of our investigations and experience we have evolved what I call seven golden rules. Briefly they are:

- (1) To prepare for inconvenience and take it good-humouredly;
 - (2) To make best of raw labour by dividing operations into their simplest possible form. Sometimes to use rough and ready methods on processes;
 - (3) To spend some time combating nervousness, etc., of young women and youths unused to factory surroundings and work;
 - (4) To select best workers and put each in charge of 6 or 7 machines as supervisors to keep control of newcomers and help with difficulties;
 - (5) To use skilled, tactful men the whole time to deal with difficulties or delays happening to substitutes;
 - (6) To keep men and women newcomers on separate sections, even in shifts.
 - (7) Welfare Work to keep employees comfortable, interested, content and fit.
- Let me take these points one by one and show how we have put them into practice.

ONE: Putting A Good Face On Difficulties

To begin with all executives have been told that they must expect all kinds of upsets, from personal disagreements to sheer stupidity in work. Normally half these upsets would not be tolerated, but today executives and the staff under them are instructed to

Detailed methods of introducing "dilutees," training them to first-class efficiency and making them feel happy in their work will be described in future articles. But certain common-sense and human fundamentals are a first necessity. They are outlined here from the successful experience of a medium size factory manufacturing essential war products

By G. C. ORMONDROYD,

Works Organiser

adopt a helpful, understanding attitude. They have been made to realise that they cannot demand of newcomers what they would of experienced staff.

This policy has been very helpful in smoothing out a thousand and one difficulties. As far as possible it prepares the ground for the new labour and helps to keep the experienced staff working up to normal standards.

TWO: Simplifying Operations As Much As Possible

Next there is the obvious policy of simplifying as much as possible every job. If operations are divided into their simplest form untrained labour has a far better chance of learning and doing the job quickly and efficiently.

We have made a detailed examination of every job we do, from the most elementary to the most complex. Adjustments have been made even to the point of increasing the number of processes. It means more handling and movement of components but the extra labour is justified by exceptional circumstances and the urgent demand for output.

This point is linked with that of using rough and ready methods when necessary. That has often meant the doubling of processes for the sake of simplification. We know that at some points we are abandoning the most economical and efficient methods of doing certain jobs but to make dilution work we have found it necessary to take such action for the sake of finding the simple and easy way. Untrained labour can do many single and easy parts of a job where there is no hope of their doing the whole job efficiently.

THREE: Right Introduction Of Dilutees To New Work

Combating nervousness is an im-

portant item in our scheme. Even skilled workers often display 'nerves' when they take up new jobs. Girls and youths, probably experiencing factory life for the first time, are usually very nervous.

On the work side our plan is to use them as probationers for several weeks, working as assistants to skilled men. The skilled workers are urged to be not only as helpful but also as tactful as possible to newcomers, doing everything in their power to make them feel comfortable and encouraged in their work.

FOUR: Putting The Newcomers Into Training Groups

As far as is humanly possible we select the probationers for each skilled man. If he is temperamental and 'difficult,' for example, we try to put under him probationers of equable temperament, people who will not 'get on his nerves.' It is up to our personnel management to grade recruits and to determine who they shall serve under.

Some of our skilled staff are used as working foremen and supervisors over batches of new staff when the newcomers are sufficiently trained to be doing, say, machine jobs. One good man can easily control six or seven machines and keep working on production.

FIVE: Skilled and Tactful Full-Time Supervisors

In charge of these groups are skilled men who put in all their time supervising—dealing with the difficulties and delays that happen to substitutes. These men are chosen for their tact and ability to control others as well as for their individual skill. It is up to them to see that the men in charge of the groups are handling the new staff

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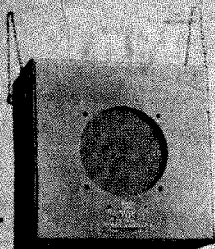
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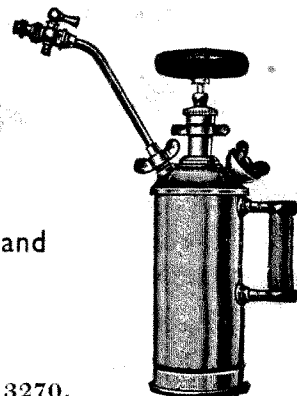
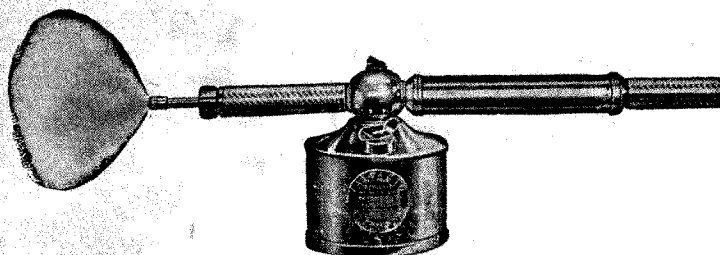
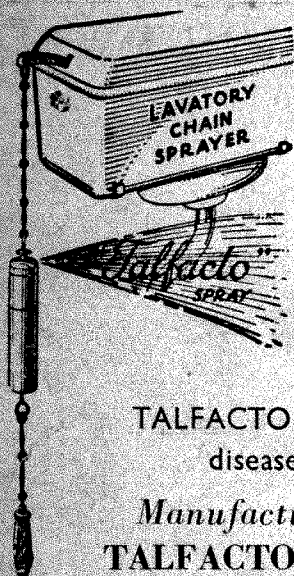
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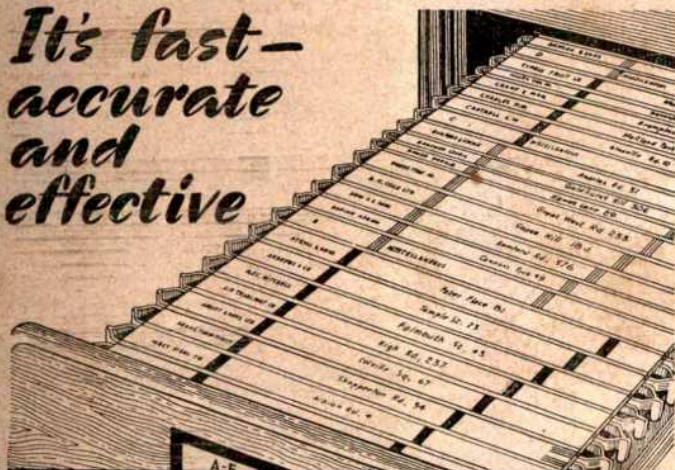


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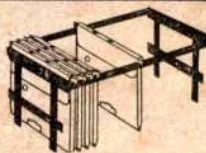


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Nuswift Engineering Co. Ltd. ...	30	Wilkes, James Ltd. ...	27	MANIFOLDING REGISTERS		TELEPHONES & ACCESSORIES	
Pickering & Haldane (Camnets) ...	25	CYCLE PARKS		Egry Ltd. ...	4	Dictograph Telephones Ltd. ...	30
Woodhouse Products Ltd. ...	Cover ii	Constructors Ltd. ...	3	OFFICE EQUIPMENT & SUPPLIES		TIME RECORDERS	
ASSOCIATION ADVERTISING		DICTATING MACHINES		Constructors Ltd. ...	3	Gledhill-Brook Time Recorders Ltd. ...	30
Bradford Dyers' Association Ltd. ...	29	Dictaphone Co. Ltd. ...	1	Ofrex Ltd. ...	31	TYPEWRITERS & ACCESSORIES	
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Pitman, Sir Isaac & Sons Ltd. ...	30	Nuswift Engineering Co. Ltd. ...	30	McGraw-Hill Publishing Co. Ltd. ...	3	Shannon Ltd. ...	4
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London Computator Corporation Ltd. ...	Cover i.					Tallanto Ltd. ...	2
Low's Calculators Ltd. ...	4						

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properly, that difficulties and delays are attended to and solved on the spot. These supervisors have a job which calls for qualities of labour management as well as sheer technical abilities.

Another important factor, we have found, is the trouble that can arise by too much mixing up of newcomers with experienced staff. As much as possible we not only keep them separate but we keep the women apart from the men.

When a batch of newcomers are trained we put them all together in a section in charge of the selected skilled men, as I have described. Where possible we use new staff all the time in the selected section.

SIX: Keeping Men and Women In Separate Sections

This policy is followed as closely as it can be in the case of women. They are put in special shops and all shifts are carried out by women. It pays us to go to some trouble to make these arrangements as we then avoid many difficulties with the men. Before we practised this policy we found the men in a section always blamed the women if anything went wrong. And there was always something wrong if a batch of men formed a shift that followed a shift of women, there was always an excuse for delays, for grumblings and for avoiding responsibilities.

Our system of segregation has stopped that. All skilled workers operate in shifts in their own sections and the new staff also work on one set of jobs.

Our policy is to keep new staff on simple operations for at least three months. We have found that to push them into more difficult work earlier than that does not pay. It shakes the confidence we have been at such pains to build up. Of course, there are some workers who are much quicker and more intelligent than others. Our supervisors are always on the lookout for these and they are promoted as quickly as their abilities allow.

SEVEN: Looking After The Welfare Of New Workers

A whole article could be written on the many factors that come under this head, and it is no exaggeration to say that this aspect of personnel management is every bit as important in making good workers out of newcomers as is careful training in the shops.

Our personnel manager, welfare organizer and their helpers do everything possible for the comfort of *all* our employees, whether 'dilutees' or old hands. Their activities range from finding suitable digs to seeing that wet clothes and shoes are properly dried in bad weather.

We have canteens, rest pauses and refreshments mid-morning and afternoon, medical and dental services, and sports clubs.

One of the most important factors,

however, is our special arrangement for dealing with personal complaints and grievances.

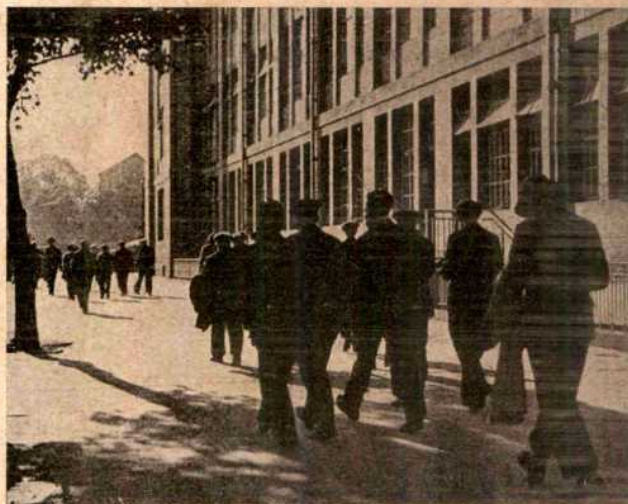
Unventilated personal grouses are a great danger in any big organization, and most prejudicial to work output.

Our works manager sits with a small committee consisting of the personnel manager and the welfare organizer. Every member of the staff knows that he or she can have direct access to the works boss to lay any personal trouble. Complaints are then investigated with friendliness, tact and yet with firmness. Rarely is a perfectly satisfactory solution not forthcoming.

The very fact that it is *known* that the works boss and the whole authority of the management behind him is open

to any complainant keeps trouble down to a minimum. It is only when personal troubles cannot find an outlet to authoritative judgment that the seeds of real trouble are laid.

This scheme to make dilution work has been quite successful, not only in the case of the company referred to here but also in other types of important factories. As experience shows, the major problem is not the straight teaching of how to do a simple job; it is a complex problem of dealing with variable and difficult human beings, of preventing jealousy, discord and dissatisfaction, of smoothly absorbing big numbers of strange and industrially backward persons into an organisation that is probably strange to them.



These are the Seven Broad Rules for Making Dilution Work

1. *Prepare for inconvenience and take it good-humouredly*
2. *Break down operations into their simplest possible forms*
3. *Spend time combating nervousness of newcomers unused to factory work and conditions*
4. *Put best workers in charge of small groups*
5. *Use tact in dealing with difficulties due to inexperience*
6. *Keep men and women newcomers in separate sections*
7. *Make full use of best possible staff welfare methods*



Management in War, from Page 11

paper has evaporated. Some executives are, in fact, condemning the situation as a public scandal.

Waste paper merchants say it is increasingly difficult to accept and store the material collected, while the paper manufacturers complain that the limitation order on the production of paper holds. They point out that manufactured paper can be far more easily and economically stored than can waste paper. It need not be distributed or used.

In the meantime many business firms, discouraged by the official attitude are less attentive than they were to making economies in paper. This carelessness, however, should not be indulged as the position in regard to paper supplies is no easier, and shows no signs of becoming easier.

Institute More Staggered Pay Days

MANY big firms already pay out on days other than Fridays. To give families a better chance of getting their shopping done, however, the practice should be much more widely used.

It is not only the blackout and early closing hours that make this desirable but the system of food distribution—not working too well—penalises the housewives who do not get their money till the week-end.

The actual rationing plan is working very well. It is the position of the unrationed foods on which housewives depend to supplement the bare necessi-

ties that is unsatisfactory.

In many parts of Britain there are acute local shortages of these goods. So far as the shortages are due merely to mistakes in distribution, they can and should be remedied. Vast movements of population have taken place in recent months, and it is obvious that suppliers can only keep pace with these movements if they know how many people have moved to which places.

There is vital need for regular Government information on population movements. It is a thing that should be undertaken at once.

Quite apart from mere local shortages, however, there is an admitted and a growing shortage throughout the country of many kinds of food which have come to be looked upon as a regular and normal part of the nation's dietary. Eggs, dried fruits, biscuits, fish, tinned salmon, chocolate are outstanding examples. At the moment these unrationed foods are being snapped up as they appear by that part of the population which has a "pull" with the local shops and by people who are first on the spot, or (in the case of foods which are not price-controlled) which can afford to pay the steadily mounting prices. This is not at all a sound way of distributing food in wartime.

"First come, first served" does less than justice to men and women who have little leisure from war-work.

It is obvious that tens of thousands of women kept back from the shops by the Friday evening pay packets haven't a chance to buy what they need.

Holidays For Service Leave

One of the war's minor problems is how to deal with the many requests by female staff for time off to visit friends or relatives in the forces who are on final overseas leave. One firm has issued the following instruction to its staff:—

"... we are anxious to give consideration and uniform treatment to the women who are intimately concerned with this event. Where permission is applied for it has been decided to grant leave of absence, without pay, on the understanding that absence from work must not extend beyond one week. This privilege is only to be granted where a man in the Forces has been given leave before proceeding overseas."

Cost of Living Up!

IN the *Daily Telegraph* recently, "Peterborough" cited the following transaction. A Government department requiring a picture unobtainable in London, wrote to the publishers in the country. The postcard was sent promptly, with the following invoice—in duplicate:

1 postcard	...	...	2d.
Postage	...	...	2½d.
Booking fee for small orders			6d.
			10½d.
Purchase tax	...	...	2½d.
Grand total	...	1s. 1d.	

MONTHLY ORGANISATION OF WORK		1	2	3	4	5
		Post statements to all accounts, builders' supplies, and country accounts	regular accounts, special supplies, and country accounts	Over due accounts come up for review Dictate letters on accounts that require special attention		
6	7	8	9	10	11	12
	Second follow-up to old accounts, two instalments over due. Fourth follow-up (personal call) to new and old accounts, three instalments over due. Pick up merchandise, accounts 115 days over due.			First statement instalment accounts, no note. Second statement instalment accounts, 30 days over due A-N. Third statement instalment accounts, 60 days over due B-N. Fourth statement instalment accounts, 90 days over due C-N.		Dictate letter country accounts 30 days or more over due
13	14	15	16	17	18	19
Dictate letter to special accounts over due	First follow-up new account, one instalment over due. Second follow-up new account, two instalments over due. Third follow-up new account, three instalments over due. First follow-up old account, two instalments over due. Third follow-up old account, three instalments over due. Fifth follow-up old and new accounts, four instalments over due.			Dictate letter regular accounts 60 days over due, ledger number 1	Dictate letter regular accounts 60 days over due, ledger number 2.	Dictate letter builders' supplies accounts over due
20	21	22	23	24	25	26
	Dictate letter regular accounts 60 days over due, ledger number 3	Dictate letter regular accounts 60 days over due, ledger number 4	Second follow-up old accounts, two instalments over due. Fourth follow-up (personal call) to new and old accounts, three instalments over due. Pick up merchandise, accounts 115 days over due.		First statement instalment accounts, no note. Second statement instalment accounts, 30 days over due A-N. Third statement instalment accounts, 60 days over due B-N. Fourth statement instalment accounts, 90 days over due C-N.	
27	28	29	30	31	Handwritten Notes	
	First follow-up new account, one instalment over due. Second follow-up new account, two instalments over due. Third follow-up new account, three instalments over due. First follow-up old account, two instalments over due. Third follow-up old account, three instalments over due. Fifth follow-up old and new accounts, four instalments over due.				* Note A. "Kindly include the (August) instalment with your next payment." † Note B. "Kindly bring instalments up to date." ‡ Note C. "This account is long over due; please give it immediate attention."	

An Accountant's Monthly Work Sheet

By setting out on an ordinary calendar sheet his main jobs of the month this executive can more easily work to schedule. The marked-up sheet is slipped under the glass top of his desk where it can be easily seen but not disturbed. It is a simple idea but very useful as a memory-jogger for any kind of work

TREND OF TRADE

Control Inflation: Push the Export Drive

These Are 2 Most Urgent Lines of Action Now

Says CECIL CHISHOLM, M.A., Business Consultant

A YEAR ago I pointed out that the primary danger to business was inflation. Since that time no completely effective steps have been taken to avoid it. As a result the problem is not to *prevent* inflation, which is already here, but to *control* it.

During the past year the rate of our expenditure has increased by around 50%, from £3,000 millions to £4,600 millions per year; but the Government's income from all forms of taxation cannot exceed £1,446 millions. Fortunately the country is already saving at about the rate of £1,200 millions. So the deficit is of the order of £1,906 millions, about 40% of our total expenditure.

How To Check Inflation

WHAT are the brakes which prevent inflation? One is an Income Tax of 8s. 6d. in the £1, another is Super Tax, a third is price control, a fourth is rationing, but the necessary fifth—*wage levels control*—is missing.

Considering that this vital part of the machinery of financial control is absent, the amount of inflation to date is admittedly slight. Retail prices are only up by 26%, wholesale prices are up 45% and raw material prices about 30% (*Economist* Wholesale Index).

In each case some two-thirds of the rise took place in the first four months of the war. Throughout 1940, however, the rise has been steady at its slow pace, and it continues. At the present rate the cost of living will be up at least another 10-12% at the end of 1941. But should the cost of steel (already 50% above pre-war) and the cost of clothing (also 50% up) continue their rapid rise, the increase in the cost of living (and therefore of wages) may be much higher.

Shop Sales Declining Satisfactorily

HOWEVER, the situation remains steady. The new measures to curtail expenditure are being very effective. In November shop sales increased by only 0.3 over a year ago, which means a net decline of around 25%. The decline is much higher in West and Central London (—16.4) or a fall in value of some 41%. Actually this is an improvement on the recent level of sales in London. The City's shops were fortunate in having more tax-free stocks than were available in the Provinces, because buying had been less brisk for so long. Hence the temporary improvement.

Significantly enough, stocks are now running down very fast. Total stocks

in the whole of the country's shops show an increase of only 3.4%—a net fall in volume of around 22%. Non-food stocks have fallen still further, by 0.2%, a fall in the volume of 25.2%.

Only in Scotland are sales maintained at anything like last year's level. Non-food sales are actually up by 20.8% (net fall 4.2%) women's wear sales are up by 25.8% (net rise .8%) furnishings by 17.3% (net fall 7.7%). Over the whole country sales of furnishings fell by 10.9% and women's wear by 7.1%.

Clearly the Purchase Tax and the limitation of supplies are having their effect, although we have nearly nine hundred thousand more people employed, earning on an average 15-20% more. The shops are selling about 25% less goods. This is a highly satisfactory result for a country anxious to spend every possible penny on armaments and export every possible ton. But both saving and taxation must increase if the rising number of workers and the increasing total of wages is not to inflate prices of our reduced volume of goods for civilian consumption.

Exports Are Still Down-In-The-Mouth

THE export trade figures are depressing. They are more depressing when it is remembered that they include a certain amount of armaments for Libya and Egypt. Apparently it has been found impossible to separate much of our armament traffic from our normal exports.

Without allowing for this, exports fell by 42%, imports by 13.2%. Allowing for the rise of 25% in retail and 30% in wholesale prices the declines are probably much larger. Fortunately most of the declines in imports are due to food, drink and tobacco (£5.9 millions), but imports of raw materials also fell by £4.3 millions, which is more serious. Imports of manufactured goods fell but little, but those of iron and steel machinery and chemicals actually rose.

In the case of exports, the largest fall was in coal (of which we exported little over £700,000 worth) and in vehicles. The decline in imports must probably continue, to increase our imports is vital to the country's finances. Progress by the Export Council in getting the Groups to work on constructive selling is too slow. Government red tape is too rife at both the Board of Trade and Department of Overseas Trade. Business men must see that these Departments have a thorough shake-up in the near future!

RETAIL SALES	Oct., 1939	... 109
	Sept., 1940	... 103
	Oct., 1940	... 117
1937=100		
RAW MATERIAL IMPORTS	Nov., 1939	... 22,300
	Oct., 1940	... 23,000
	Nov., 1940	... 18,900
Thousands £'s		
TOTAL IMPORTS	Nov., 1939	... 81,300
	Oct., 1940	... 84,100
	Nov., 1940	... 72,200
Thousands £'s		
TOTAL DOMESTIC EXPORTS	Nov., 1939	... 37,400
	Oct., 1940	... 23,300
	Nov., 1940	... 21,600
Thousands £'s		
REGISTERED UN-EMPLOYED	Nov., 1939	... 1,400
	Oct., 1940	... 835
	Nov., 1940	... 791
Thousands		
COST OF LIVING	Nov., 1939	... 105.5
	Oct., 1940	... 117
	Nov., 1940	... 118.2
1929=100		
WHOLESALE PRICES	Nov., 1939	... 94
	Oct., 1940	... 106.8
	Nov., 1940	... 108.3
1930=100		

First Steps in Setting a War-Time Budget



This article does not discuss the *purpose* of a Budget: that, it is assumed, is already understood. Nor does it tabulate results, which, after all, could pertain only to this particular example. The writer offers wider guidance, a step-by-step outline of how his Company's Budget was installed: he gives the "*How To Do It*" which, it is hoped, will be of some use to those executives who might be still in doubt as to the best way of making a start on a Budget Scheme of their own.

MANY articles have been written about budget systems, but usually with respect to their purposes and results and not to the method of installation and introduction to the individuals and executives who will be responsible for their operation. The following procedure is prepared for this purpose and is applicable to a company which has numerous departments, factory, and sales offices, and which has previously had no budget at all.

This company has decided to install a budget system for all its operations. A general description of the proposed system and the procedure to be followed is given below:—

1. Nature and Definition of Budgets

The company will install three types of budget, as follows:

- (A) Operating Budget.
- (B) Expense Budget.
- (C) Cash Budget.

These are described briefly as follows:

(A) Operating Budget

An Operating Budget is the planning or charting of estimated or desired operating results for a definite period into the future. It includes volume, as well as value of sales; also cost of sales, expenses, operating profit or loss, miscellaneous income and miscellaneous charges, with estimates for each shown on a monthly basis for several months

By a BUDGET CONTROLLER

in advance. Such a budget will be prepared in the same form and order as the regular profit and loss and operating statements, so that comparison with actual results will be easy.

(B) Expense Budget

An Expense Budget is the tabulation of estimated or allowable items of expense (as distinguished from items for inventory, productive labour, capital expenditures, etc.) by accounts and by fiscal periods. From it is determined the amount of expense that goes into the operating budget, although the latter is concerned only with that part of such expense allowed to the operations of the period under consideration. This may be more or less than the estimated total expense for the period, part of which may be deferred or accrued.

(C) Cash Budget

The Cash Budget is an estimate of the expected cash receipts and expenditures resulting from the company's operations for the period covered. It is, of course, dependent on both the operating and expense budgets for cash income and expenditures involved in those budgets. It must include, also, other items not directly connected with the operating and expense budgets, such

as expenditures for inventories, productive labour, capital additions, dividends, income tax, etc. In short, it is an attempt to forecast the Cash Book itself, both on the receipts and disbursements side.

2. Purposes and Advantages of Budgets

Budgets have many uses and advantages, which will become more apparent after a sufficient period of actual and successful operation. However, a few of them are enumerated below:

(A) The preparation of an Operating Budget requires careful planning, clear thinking and a charting of the course to be followed. Few jobs can be well done unless well planned, and the setting of a definite goal automatically induces thought and planning as to how to reach it. Frequently this enables difficulties to be met, minimized, or avoided *in advance* thus resulting in less-troubled and smoother operations.

In war time of course all forecasting and planning is more difficult and must necessarily be of short range. But it can be done.

(B) The setting of a definite goal of achievement causes all departments and members of the organization to focus and concentrate on its attainment.

It definitely allocates responsibility, and acceptance of this responsibility means greater care, more careful planning, and intensive effort to produce the results.

It is here that everyone involved can demonstrate his interest in and value to the firm. The budget sets a standard or "par" performance against which each can measure his achievements. Some individuals, by the nature of their work, can contribute more in a financial way to the success of the company than others, whose positions are either of a subordinate nature or of the type where large contributions measured in cash cannot be made; but all can be on an equal basis with respect to budget performance.

(C) A budget provides, to some extent, a glimpse into the future, an

idea of where the company is likely to go. The clarity or value of this vision is, of course, dependent on the accuracy of the budgeting and the soundness of the assumptions on which it must be based; but even a short glimpse is better than none.

(D) Since a budget represents what should have been done, or it was desired to do, in any particular month, comparison with actual results becomes a measure of the attainment. It permits a much better evaluation of what happened than the old-fashioned comparison with last month or last year. For example: The operations for the first few months of the year may show a small profit or even a loss, which, upon the basis of the bare figures themselves, might appear discouraging. The budget, however, may show that such results were to be expected during that period and yet, that the year, as a whole, has a very satisfactory budgeted income. If the actual results, therefore, no matter how poor they appear, are better than the budget, they become a matter of great encouragement rather than the reverse.

(E) One of the greatest benefits to be obtained from a budget is the control of expenditure. In the preparation of the budget, the tendency is to determine and set up the proper amount of expenditure to go with the operations being budgeted—to bring the two in proper balance. In other words, such items are considered in relation to the operations as a whole, and not just separately. This insures a better determination of their amount and necessity, gives them authorization in advance, and controls them. One danger here is that inclusion of an item in the budget may be construed as a "license" to spend, even though later developments may show the expenditure not needed, or at least not in so great an amount. The thought in the mind of everyone should be to *do better than the budget*, and if properly set up, comparison of the budget with actual results will show clearly where such gains have been made and who is responsible for them.

3. Preparation of Budgets

(A) The Operating Budget will originate in and be prepared by the following operating divisions and departments:

- (1) Individual sales offices.
- (2) Head office sales department.

(B) The Expense Budget will originate in and be prepared by every department of the corporation as follows:

- (1) Individual sales offices.
- (2) General sales department.
- (3) Individual factories.
- (4) General manufacturing department.
- (5) Purchasing department.
- (6) Insurance department.

FIRE BOMBS!

A Fire-Watcher must guard your premises at night

It is a tough job: not easy to find personnel who will do it

The 'Electric Eye' AUTOMATICALLY Spots Fire Bombs

goes a long way towards solving your Fire-Watcher Problem

See Page 23

- (7) Personnel department.
- (8) Advertising department.
- (9) Accounting department.
- (10) Legal department.

(C) Cash Budgets will be prepared by the accounting department for all other departments and operations of the company.

4. Period Covered By Budgets

(A) The budget period will be the full fiscal year.

(B) Budgets should, under present conditions, be revised monthly. They should normally be available approximately as follows:

Budget No.	Period Covered	Available
1	12 months	Dec. 15
2	9 months	March 15
3	6 months	June 15
4	3 months	Sept. 15

but today's conditions do not permit of this range. Firms must therefore plan to suit their own special circumstances.

5. Assembling of Budgets

The duty of assembling and collecting the budgets prepared by the various units listed under Section 3 will be assigned to the controller. He will also prescribe the detailed methods to be followed, provide all necessary forms, and see that all budgets and collateral information are prepared and received in time for official action and acceptance. The controller will, prior to the preparation of budgets, consult with each executive, department head, or individual concerned with their preparation, going over the peculiar conditions or problems of each, and giving such guidance as may be necessary, and which cannot be covered in general instructions such as these.

6. Approval and Acceptance Of Budgets

(A) All budgets prepared by the various units, as prescribed under Section 3, will first be submitted to the executives in charge of those units for checking, revision, and approval.

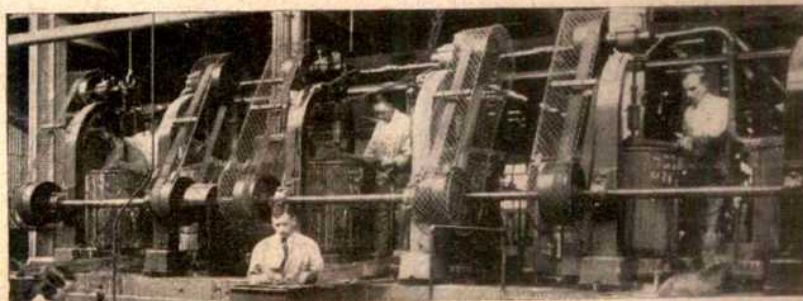
(B) Each budget so approved will then be sent to the controller for assembly into the master budgets of the company.

(C) The master budgets, together with the supporting individual budgets, will then be presented by the controller to the budget committee for final approval and acceptance.

(D) The same procedure will be followed for all monthly revisions of

The war and the all-round difficulty of everything just now bring in tremendous problems that call for the very careful planning of all operations, together with close control and great economy in expenditures. While the preparation of these budgets may appear at first to be burdensome, it is believed that the results obtained, as well as the greater interest resulting from planning the work and checking the actual results against the plan, will more than compensate for any extra work involved.

And a sound budget system will unquestionably lay a better foundation for business in the better times to come.



budgets as specified under Section 4.

7. Budget Committee

(A) The duties of the budget committee shall be as follows:

- (1) Approval and acceptance of original and revised budgets.
- (2) Approval of special non-budgeted items.
- (3) To hold regular meetings for the following purposes:
 - (a) Items (1) and (2);
 - (b) comparison of monthly reports of actual results with budgets. (These meetings would be held after monthly financial figures are available and before meetings of Board of Directors);
 - (c) general company planning.

(B) The following shall constitute the budget committee:

- (1) Managing director; (2) Secretary; (3) Chief accountant; (4) Controller; (5) Sales manager; (6) Production manager; (7) Chief buyer.

8. Presentation of Budget Results

The usual financial, operating, and

expense reports prepared by the accounting department will show actual results compared with budget estimates. These reports should be studied carefully to determine the amounts of and reasons for the variation from anticipated results. This will serve as a valuable guide for the succeeding period and in developing any places where correction or adjustment is needed for the successful operation of the budget.

9. Budget Methods and Forms

The controller will prepare detailed procedures and necessary forms for all budget units as defined in Section 3. This will insure their being set up on a standard and uniform basis, thus facilitating their inclusion in the master budgets.

10. Expenditures Not Covered By The Budget

The general policy of the company is that no expenditure not included in the budget be incurred until it has had the approval of the budget committee. Exceptions may be made to this where the amounts are nominal, or where

authority and discretion may have been granted to certain divisions up to specified amounts by special rulings of the budget committee. In the case of emergency items that cannot wait for regular meetings of the budget committee, quick approval can be obtained by an informal poll of the committee, or by subsequent ratification at a committee meeting if the situation justifies.

11. General

The war and the all-round difficulty of everything just now bring in tremendous problems that call for the very careful planning of all operations, together with close control and great economy in expenditures. While the preparation of these budgets may appear at first to be burdensome, it is believed that the results obtained, as well as the greater interest resulting from planning the work and checking the actual results against the plan, will more than compensate for any extra work involved.

And a sound budget system will unquestionably lay a better foundation for business in the better times to come.

Modern Stock Control Cuts Costs at These 9 Points . . .

THE severe restriction of almost every sort of material makes the tight control of stocks more essential than ever before. This applies to every kind of manufacturing concern.

Stock is now even more valuable than cash, therefore is it not inconsistent for a firm to spend time and energy locating an error of sixpence in the petty cash or stamps when the entry in their profit and loss account representing "stock" is often no more than a rough approximation?

Accurate stock records are essential

to economic management, not only at inventory time but throughout the working year. Consider the factors of control they introduce:

1. Preventing Leakage and Waste.

Leakages from any cause are revealed: e.g., pilferage, defective work, incorrect issue of materials, insufficient storage, etc.

2. Over-Buying; Over-Production.

As the rate of consumption of each

article is revealed there is no excuse for buying or making goods in excess of requirements.

3. Running Out of Stock.

Stocks can be maintained at a level indicated by the Sales Ledger so that delays do not occur in the execution of orders because of shortage of supplies.

4. Elimination of Dead Stock.

Slow moving or dead stock is brought to light and steps can be taken to dispose of it.

5. Inefficient Buying.

If the market price is subject to fluctuation and the issues are credited at current market prices the stores ledger will show losses or gains on buying.

6. Perpetual Inventory.

The stores ledger provides a perpetual inventory which is more likely to be accurate than a physical inventory taken against time. Several items can be checked weekly with an actual count, discrepancies investigated and corrected, so that the book figure is as reliable as any figure can be.

7. Location of Stock.

The stores ledger definitely indicates where each item of stock can be found.

8. Good Effect On Staff.

Stores will be handled and issued with greater care when employees know that a check is being kept, and that someone will be called upon to answer



Speeds-Up Records Of Conferences

With small microphone (shown in centre of table) the dictating machine records Board meetings, conferences, etc. Arrangement can be made for recording of any length without intermission. Cylinders as they are filled can be removed for transcription so that full typed reports can be given to delegates a few minutes after close of the session. 'A' shows control panel under chairman's hand; 'B' is the recording unit standing away in a corner.

for shortages.

9. Fire Insurance Claims.

The stores ledger will provide valuable evidence in the event of a fire.

Even the above points do not cover the whole range of advantages to be derived from a proper system of stores

records as businesses differ. But any progressive executive can visualise the possibility it offers in his own concern.

In next month's issue of *BUSINESS* will be published a specific article dealing with Stock Control.

done. They are voicing the need for an identifiable motive force, as distinct from a component part of a committee that can (and usually does) 'pass the buck' when challenged.

The "business man" thus has quite a high reputation in the public mind. The organization of individual businesses should be such as to substantiate this belief.

By the Way . . .

BEWARE HABITS

HABIT rules most men's lives. Getting up in the morning, eating, drinking, catching the train, etc.—all automatic actions. Habits are energy-savers because we don't have to expend much thought on them.

That is good, but when habits enter business they bring mediocrity in their train.

This must be so because methods of doing things constantly change, they are improved. The man who has become a creature of habit is therefore outdistanced. He sticks to his routine when the method is worn out.

Only one business habit is worth sticking to—honesty.

For the rest a business man should build his routine structure so that it can be adapted to the times: quickly, smoothly, at any point.

The right way to use a habit is this: utilise it so that you can do the little things mechanically and conserve energy for the big ones.

LEARN FROM OTHERS' MISTAKES

"WITH me the subject of mistakes is a favourite topic of conversation when I am talking to a business man," remarked the 70-year-old head of one of the country's most successful firms recently.

"It doesn't matter whether that man is a controlling executive or an artisan I like to talk with him about the blunders—and of course their corrections—of which he has had experience.

"There is a lot in the old adage that a man learns more by his mistakes than by his successes. His mistakes, their consequences and their correction he is certainly likely to remember the more clearly.

"I don't, therefore, consider it 'negative' to discuss mistakes. On the contrary, I believe it is very positive.

"I think one of the very best times to broach the subject of mistakes is when looking over a factory other than one's own: and I take every opportunity of visiting other works; every executive should.

"It is very instructive to hear why a process failed, why a certain type of machine didn't stand up to its job, why a particular material was a wash-out for a certain purpose, why a workman

was injured, why an expected order failed to materialise, why a delivery couldn't be made on time, why a Board wouldn't sanction such and such a suggestion, and so on.

"People do not always tell you these things right out in plain language. Naturally, they wouldn't. But you can get at them in a light conversational way, and they are highly instructive—if you know how to use the information and profit by it."

PASSING THE BUCK

ONE of the biggest factors in good organization is the arrangement that only one individual is ultimately responsible for any particular thing. When more than one person is held responsible the real responsibility cannot be located anywhere.

What countless, near-tragic examples of this have been (and are still being) demonstrated before our eyes in bureaucratic circles.

When people say "Put a Business Man in charge," they are expressing the concept that a business man is an individual who clearly and openly carries responsibility for getting things

THE ONE BEST WAY

A POPULAR illustrated weekly shows pictures of American executives busy at a Work Simplification Conference. A large notice above one of the experimental tables reads "The One Best Way! Look For It! Find It! Use It!" Around the table are six business men playing with a model conveyor belt, a lot of small bottles and some gadgets. They are devising ways and means of simplifying human operations at a bottle-filling machine. By simplification they will thus speed up the operations, get more output for less effort. They think it worth while to go to much trouble to secure this.

The paper publishes British expert's comment on the idea: "There is no one best way of doing a job. There are usually two or three equally good ways. It is wasting an operative's time to forbid him to use a method he has been using for years to substitute your one best way."

Name of this "expert" is not given. We don't wonder at his modest refuge behind anonymity. The latter part of his comment particularly is entirely fallacious.

Time and motion study, properly observed and applied, is one of the greatest labour-saving and fatigue-reducing principles ever devised. Executives in any modern, progressive manufacturing concern can confirm this.



One of the series of interesting pictures from the weekly "Illustrated" (Jan. 4th issue) on scientific experiment and training to beat fatigue. See item above, "The One Best Way."

Quicker Collections with Less Trouble When We Put in This One-Machine A/cctg. Plan

"We now get in large sums of money thirty days earlier than we formerly did. One machine handles every phase of our 8,000 accounts. It paid for itself within 12 months . . ."

THE moment war hits a country business credit almost ceases to exist. Everybody wants cash, and wants it quickly, so normal routine becomes inadequate to the situation—at least that has been our experience and I don't think we are in any way unique.

Our problem then, fifteen months ago, was to get in much more quickly our heavy load of receivables. The products we sell represent fairly big money units and our basis of trading allowed of fairly elastic terms.

We made a quite close investigation into ways and means of reorganising our accounting department to speed up the routine, and the experts we consulted persuaded us that the job could be done by mechanising our system on the basis of a single general-utility type of accounting machine.

As I say, that was more than a year ago. Since then the results have come in for some pretty close examination

Says this
**SECRETARY AND CHIEF
ACCOUNTANT**

and the verdict is: the change has more than justified all claims made for it.

**We Doubted If Machine Could
Do The Job**

Frankly, we had our doubts that a single machine could handle every phase of our 8,000 or so accounts. But as it is our operator devotes only about half her time to the machine and is thus available for a considerable amount of other work.

From our point of view, the overwhelming value of having mechanized accounting is that now we get our money in hand one full month ahead

as compared with the old system. Every statement goes out early in the month; and as, by tactful correspondence, we have persuaded our customers on their part to settle our accounts promptly, we are provided with a large sum of money thirty days sooner than we used to receive it. This in turn allows us to secure all possible cash discounts. I would say that this alone paid for the machine twice over within the first year.

A brief account of one aspect of our method of accounting may be of interest. Our sales ledger system is simple and yet probably typical of a great many other companies in this country. All accounting for our nine provincial branches is centred at our head offices in London. The machine automatically provides duplicates, which keep our managers informed as to the state of accounts in the territories of each.

Invoices, credits, or other items relating to customers for each day's business are assembled alphabetically so that everything pertaining to an individual account is handled at one operation. The statement (to which a flimsy is attached) and the ledger card are handled at one operation. As the operator proceeds with the day's entries separate totals of all operations automatically accumulate in the machine.

Full Information Provided With Minimum Effort

A typical statement (below) will illustrate the completeness of the information which the machine provides with a minimum of bookkeeping or effort. In the case shown the debit of £5 stood against the customer at the first of the month, the "LA" being our symbol for head office. Had this been a credit instead of a debit it would have been printed in red by the machine. Each item is described by the machine, both for the convenience of our customers in checking their accounts and for quick reference on our part.

The first debit of £3 10s. was for an operator supplied from our London office (probably necessitated by illness on the part of one of our customer's staff). Having carried forward the balance of £5, the machine automatically adds the £3 10s. and carries it to the balance column, the "T" meaning total for that operation.

The next debits for £65 and £3 10s. show that a machine was sold to our customer through our Manchester office and that cylinders to the value of £3 10s. went with it on the same day. The next item shows a credit for the amount outstanding at the first of the month. The machine, after the opera-

(Continued on Page 30).

STATEMENT

HENRY SMITH & CO. LTD.
19 CREDIT STREET
LONDON.

ACCOUNT REF. HEN

DATE	PARTICULARS	DEBITS	CREDITS	BALANCE DUE
1 SEP 38	LA	3. 5. 0		3. 5. 0
1 SEP 38	LA	1. 15. 0		4. 7. 0
1 SEP 38	LA	3. 10. 0		7. 8. 0
1 SEP 38	M	65. 0. 0		72. 8. 0
1 SEP 38	M	3. 10. 0		76. 0. 0
1 SEP 38	G	6. 6		82. 6. 6
1 SEP 38			5. 0. 0	77. 6. 6
1 SEP 38				72. 6. 6
1 SEP 38				72. 6. 6

HENRY SMITH & CO. LTD.
19 CREDIT STREET
LONDON.

SEP 1

DATE	PARTICULARS	DEBITS	CREDITS	BALANCE DUE
23 AUG 38	142. LA	3. 5. 0		3. 5. 0
23 AUG 38	152. LA	1. 15. 0		4. 7. 0
1 SEP 38	153. LA	3. 10. 0		7. 8. 0
1 SEP 38	12973. M	65. 0. 0		72. 8. 0
1 SEP 38	12973. M	3. 10. 0		76. 0. 0
1 SEP 38	12973. G	6. 6		82. 6. 6
1 SEP 38			5. 0. 0	77. 6. 6
1 SEP 38				72. 6. 6
1 SEP 38				72. 6. 6

• Shown here are ledger card, customer's statement and a flimsy, all of which are produced in one operation on the machine

Simple Self-Contained Folder System For Personnel Records . . .

p17695

EVEN though at the present time, labour turnover in most businesses is higher than normal and many people seeking engagement have it in mind to stay in the job only for the time being managements will still do well to try and make their staffs as permanent as possible.

Good use can still be made of printed application forms for candidates to clerical and other positions.

The usual method is to keep the application forms of engaged employees in some sort of card index form. This is quite a good plan, but a variation of it which makes this system still more complete is used by one well-known concern. The idea may prove useful to other personnel managers.

Each Record More Compact And Easier to Handle

The basis of the plan is that the application form, instead of being just a separate sheet, is printed on the inside of a good quality folder, quarto size.

This folder thus serves as the application form itself and a filing folder for all subsequent papers and records which need to be filed or kept in connection with each employee.

In this company employees may be engaged at any one of several points where the firm has branch factories and offices. It is necessary therefore for branches and head office to have a personnel record of each employee. The original is made out when a prospective employee arrives for a job and is retained by the branch where the application is made.

When the applicant is accepted and put to work a copy of the application is typed out on a new folder and sent to the head office where it goes into the "master" personnel file in alphabetical order.

Records of all future transactions regarding each employee are in due course sent for insertion in this master folder which thus automatically becomes the combined file and dossier of the employee.

For example, when there is a change of salary or wage-rate, a transfer or promotion, there are special forms for recording these changes. Copies of these forms are filed at the branch and at head office so that all information is concentrated in the folder record.

A long time before the war the personnel manager of this concern thought it would be a good plan not to scrap the records of people who left the firm's employ but to transfer them to a special file.



Before an employee leaves he is interviewed and invited to give his reasons and any details he cares to about his proposed new work. A record of this data, added to his current dossier is then put away in a special file. This plan has enabled the firm to overcome many war-time staff difficulties by getting back previous employees.

Before an employee left the personnel manager would interview him and would enter on his record all the details he would care to give as to his reasons for leaving and the kind of new work he was taking up.

Reinstated Past Employees to Offset Staff Shortages

Since the war this file of past employees has well justified its existence. With the labour situation difficult, especially as regards women employees, several old hands have been contacted and induced to return to work for the firm.

"Our work," the manager told us, "is not of a highly specialised nature but it does help enormously if you can get employees who have already had some actual experience in your methods of working."

"For example we contacted a woman employee who left us three years before the war to get married. Her

husband joined the Forces in December, 1939, she had no family ties and was delighted to return to us in her old position in the accounting department. Within a few hours she was perfectly settled in her work.

"As we are careful in selecting new employees this saved us many hours—many days in fact—in finding and selecting a suitable girl and it obviated all the difficulty of teaching a new girl the work."

"By the same means we got a relief telephone switchboard operator. And this was specially fortunate as our chief switchboard girl soon after joined the Auxiliary Fire Service so a qualified operator already fully experienced in our particular needs could take over at once."

"In our various factories we have been able to get back several hands, men as well as women, and these have been a real godsend as they fitted in so easily."

"We even have back again a man well over sixty years of age whom we pensioned off three years ago. He is hale and hearty and is a fire watcher at one of our factories."

Not the least useful point about folder-records of this kind is that they are so convenient to handle, and they can contain photographs, copies of testimonials and other separate items without their becoming lost or detached from the employee record to which they refer.

This idea avoids the use of loose application forms and makes each employee record easy to handle for reference at any time.

The Calculating Machine Is a Focal Point In Every Business

Review of an all-British machine that
overcomes a number of war-time difficulties



The organisation of this British company includes special schools for training machine operators to high efficiency. Users of these machines can therefore be assured of the availability at all times of trained operators. Alternatively executives can send members of their own staff for training or refresher courses.

WAR-TIME trading brings so many unpredictable problems day by day that it is only by rigid enforcement of the most comprehensive efficiency that any firm can carry on. The smallest thing left to chance can result in chaos when the human element is, through force of circumstances, not altogether reliable.

Staff difficulties are, in fact, a major trouble that is rapidly becoming acute, and for this reason any mechanical or extraneous help that can relieve the situation is of enormous importance. Particularly is this true where calculations and costings are concerned because machines do not suffer from nerve-strain or fatigue, and though their proficiency does certainly depend upon the skill of their operator that skill is largely a result of sound preliminary training and routine, and as such does not make any severe claim on their mental freshness or powers of concentration.

Machines Are Used Mainly In These Three Ways

Calculating machines are no new story. They are used by practically every progressive firm, usually in one or more of three specialised ways. They may be fully centralised at one point, or they are used departmentally, or by

an executive handling figures which are too confidential to be turned over to anybody else.

A recent analysis showed that 53% of all calculations represent simple addition, 39% multiplication, 6% division, and 2% subtraction, which explains the supremacy of the key-driven machine over the crank or the key-cum-crank type, since a key-driven calculator is the simplest for addition, while at the same time it can be used for every other type of calculation.

Until the outbreak of war calculating machines were imported from Germany, Switzerland, Norway, France and America, but with the closing of these sources there was produced what is claimed to be the first and only all-British machine.

For four years the Bell Punch Company had been extensively experimenting with a key-driven calculator. During this time several hand-made models were produced, each an improvement on its predecessor. Then in March 1939, when it became obvious that war was imminent, the directors realised the importance of going into production at once, not solely because of the open market but because the development of our export trade and the building up of industries which will absorb man-power after the war is a vital national necessity. So the

London Computator Corporation was formed with a view to marketing the Sumlock adding and calculating machine.

Any Mistake At Once Proclaims Itself To Operator

A particular feature of this machine, and the outcome of long research, is the "key-lock" which shows an operator exactly where a mistake has been made and causes error rectification to become automatic without need for cancellation. It is claimed that no other calculating machine has this feature, although certain forms of key control have been used. Sumlock have applied the principle to multiplication and division as well as to addition. A consequent saving in time has been observed to result on account of the lessening of the nerve-strain upon the operator. To know that an intricate extension has not to be started all over again because of the faulty depression of a key is half-way to eliminating such accidents.

Although this machine is young in years there is behind it mature planning and presentation. Long before the public had ever heard of it the company had recognised the great importance of uninterrupted mechanical service and of intelligent, fully trained operators. The building up of such a service presented no great difficulty to the company for behind them they had the experience of the Bell Punch Company, which, since 1878, has been building and servicing Cash Control systems all over the country.

The organisation and precision which they have brought to the marketing and maintenance of ticket issuing machines and taximeters, where the slightest inaccuracy is a matter of Governmental intervention, lies behind the London Computator Corporation. Right through the country there is no gap in their mechanical services.

Executives Can Make Good Use Of This Service

Mention has already been made of the importance of trained operators, and to this end schools exist in the most important cities of the United Kingdom where pupils undergo training in all forms of commercial calculation. By no means every girl who applies for such training is accepted. The standard required is high, and more-than-average intelligence is demanded in addition to a sound knowledge of mathematics.

The majority of the girls spend three

(Continued on Page 31).

Now—

AUTOMATIC Fire-Bomb Detection

'Electric-Eye' Does It: Makes Human Watcher's Job far Easier and Much Less Uncomfortable

THE demand made by Mr. Morrison for fire-bomb watchers to safeguard every business building has raised some difficult problems for employers.

By

"BUSINESS" INVESTIGATOR

Two Main Difficulties

It is not easy to hire special watchers for night time bomb-spotting; labour is scarce. And when it comes to asking members of the staff to do it two vital points at once arise:

ONE

First there is the fact that most workers employed in London and other big centres live outside these areas and the majority—the men folk at any rate—are already Wardens, A.F.S. or other voluntary officials in their home districts. To give an example of one London firm: out of 98 male staff 80 were Wardens, etc. in their home areas, and of the remainder only two were free and fit enough to be expected to volunteer for fire watching.

To withdraw Wardens from their local sites to get them to do night duty somewhere else would completely upset the valuable local arrangements that have built up. Not only so, at night time people naturally want to guard their own homes.

TWO

Secondly, and there is no question about this, it is not easy to get employees voluntarily to stand all night, unsheltered, on the roof of their place of employment, especially in winter weather, and endure a concentrated blitz. Employers are finding this out.

In very large organizations where short spells of duty are made possible by a number of reliefs, and where resources enable comfortable quarters and feeding for watchers off duty the difficulty in regard to number two may not be so great.

But the vast majority of businesses are not large concerns. And the idea of several separate firms making a co-operative plan is not so simple to work out as it sounds.

The automatic fire bomb detector solves nearly all these difficulties, I say nearly all because it does depend, in the end, on the presence of a human watcher. But for this watcher much of the danger, difficulty and discomfort are removed, as I will show.

In short, the automatic fire bomb detector is a small light-sensitive electric cell. This cell takes the original place of human watcher—up on the cold, exposed

and dangerous roof-top. If a fire bomb falls on the roof, and is not a complete dud, its very first flicker of light is instantly picked up by the sensitive cell and relayed to sound an alarm bell or buzzer down in the air raid shelter or other selected spot where the human watcher can be waiting in safety and comfort.

That is the essence of its working. But in practice an installation does more than that. For instance, a roof may have different sections or levels divided by light-proof walls. A fire bomb may fall in any one or more of the sections. In such a case a cell would be installed in each section. These would all relay down to the single alarm in the shelter—but by an indicator the ringing alarm would tell the watcher on what section or sections a fire bomb had fallen. Thus he would know exactly where to go to tackle the outbreak.

Similarly, cells can be placed at strategic points anywhere inside the building itself. Each cell has its identification signal at the alarm point so not a moment need be lost in getting to the seat of a fire. There is no running to and fro all over the place seeking the spot.

While the active cell of the detector is exceedingly sensitive to the merest flicker of sudden light nearby (the user can in fact 'tune' its sensitivity just as radio is tuned) it is not sensitive to the gradually increasing light of, for example, dawn breaking.

If Unit Is Damaged It Still Sounds Alarm

The operation of this instrument depends on the electric mains, you plug-in. In a raid, of course, it is always possible for an unlucky H.E. to break the mains and cut off the current. If this happens the alarm of the detector automatically sounds, thus signalling to the watcher that it is out of action and indicating to him that he must take over completely.

In the same way if the mains are not hurt but any part of the detector itself gets hit and put out of action, or even if the sensitive valve falls off in efficiency (as it is bound to do in time, like a radio valve) the alarm is automatically set going. The watcher is thus never left in a position of false security.

The sensitive cell will pick up direct—or even reflected—bomb light up to a range of 40 feet. Large areas can therefore be protected by very few units. In cases of

separate rooms or offices one unit can be made to protect two adjoining offices by making a hole in the dividing wall and placing a unit so that it can receive any bomb-light occurring in either.

With this automatic spotter, (therefore, fire-bomb watching can be advanced to a luxury! instead of standing out in the open to get frozen or otherwise incommoded the watcher can stay protected and comfortable in the shelter or basement. He can even sleep, the alarm will waken him all right. He can rest confident that the little electric cells act far more efficiently than he himself could do with any amount of roof-top sentry-go or patrolling of corridors.

Of Small Size And Low Cost

In size the sensitive cell unit is smaller than a portable typewriter, and the alarm unit, with a small but efficient buzzer, about the size of a 100-cigarette box. One complete unit, including installation, costs about £10. Additional cell points cost about £7 10s. installed, but cost must of course vary with the nature of installation involved. The outlay, however, is insignificant compared with the value of building and other assets protected.

Executives will be interested in the bomb detector as a device for their homes. A single unit is ample for the average private house. It would prevent the recent experience of a director of a very well known firm. He and his family slept soundly in a well built shelter in the garden and emerged one morning to find their house a shell—burnt out. An automatic relay to his shelter would have sounded the alarm the moment the incendiary had penetrated his roof.

Mains current consumed by the fire-bomb detector is only about 6 watts. Maintenance is put at 10/- a year as an average top figure.

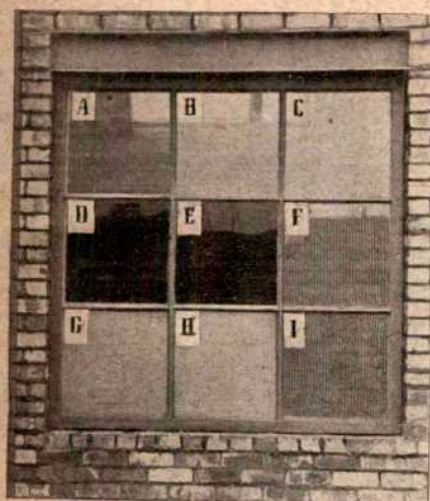
Unsealed Envelopes Can be Used Twice

FOR the following tip in regard to envelope economy we are indebted to Mr. W. Gledhill of Edward Shaw & Son, Ltd., Clough House Mills, Slaithwaite:

All in-coming *unsealed* envelopes are collected from the mail and passed to a clerk who pastes a plain paper strip over the postage stamps and cancellation marks. The firm thus secures a good supply of usable envelopes—already addressed to itself. These addressed envelopes it encloses with outgoing correspondence so that the recipient can, for his reply, use the addressed envelope and save his stationery.

Most firms receive through the post a good many unsealed envelopes (such as those enclosing receipts, etc.), which can be used in this way.

Checking Danger of Blast-Flung Glass



What Stick-on Material is Best? Here are Some Practical Tests

Short of the removal of the glass or protection by armour plate nothing can save glass from being broken, if it is within the blast area. The problem is therefore reduced to one of preventing the glass fragments from being converted into highly dangerous missiles. These tests were carried out with the latest anti-shatter materials

From Data Provided by

PILKINGTON BROTHERS LTD.

The above test window is glazed with different weights of glass protected by various types of anti-shatter material.

A, is a pane of 24-oz glass with no protective material

B, 18-oz. glass with large mesh ordinary quality anti-shatter netting (not carried over frames)

C, 24-oz. glass, same netting

D, 18-oz. glass, no protection

E, 24-oz. glass, no protection

F, 18-oz. glass, large mesh stronger quality netting

G, 24-oz. glass anti-shatter cloth protection

H, 18-oz. glass, same anti-shatter cloth

I, 24-oz. glass, large mesh stronger quality netting

IN these tests three types of net material were tried, one of anti-shatter cloth and two of larger mesh curtain netting of different weights. Two common weights of glass were used. In all cases the anti-shatter materials used contained their own adhesive and were given an extra coating of adhesive after they had been fixed to the surface of the glass and allowed to dry. On some of the panes the net was carried on to the surrounding woodwork of the frame, in other cases it was cut to fit just the glass. In every test only one side of the glass was protected.

Obviously, it was not practicable to use full size bombs. Use was made therefore of smaller bombs exploded at closer distances accurately calculated to produce the same effects as full size bombs at greater range.

First Test

With a bomb at 40 ft. (equivalent to 500-lb. H.E. bomb at 160 yards).

All the squares of glass were broken except the 24-oz. Sheet Glass in the bottom right-hand corner (pane I) of the window. The uncoated glasses had burst *outwards* and the fragments were dislodged. One pane (E) with the open mesh fabric netting had fallen out in front of the wall, but the cracked glass was still held firmly together by the netting.

Second Test

With bomb at 30 ft. (equivalent to 500-lb. H.E. bomb at 120 yards).

The anti-scatter cloth behind pane H

had split along a line 8" or 10" in extent. One of the glasses (pane I) with the fabric netting had been dislodged and was hanging in front of the frame though it was still holding all the fragments of glass together. It can just be seen hanging over the front of the frames. This pane had had one corner loosened by the first test. The 18-oz. glass backed by the heavier of the two fabric nettings (pane

broken glass, all three types of material would be of considerable value, provided they adhered sufficiently firmly to the glass.

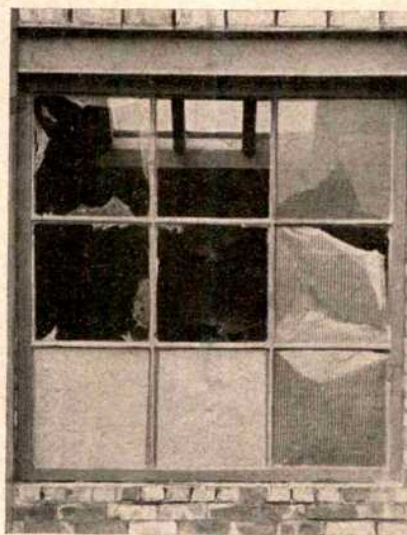
2. The effectiveness of the anti-shatter cloth can be considerably improved if after applying it by means of the adhesive with which it is impregnated as received, it is given a further coating of adhesive. Without this extra coating there is much risk that glass fragments will be torn away from the material when the glass is broken.

3. To obtain the maximum safeguard the nettings and cloth should overlap the edged of the glass, *and to be fixed firmly to the framing*, a lap of $\frac{1}{2}$ " or more all round being desirable. Some of the panes treated in this way remained in the frames after all three blasts, whereas in those on which the net was not extended over the frame the glass was thrown out of the frame although it still remained held by the materials.

Test On PLATE Glass

Fabric-Netting Covered

This test was to supplement information obtained in the others. The behaviour of the netting in the earlier tests had



See "First Test"

F) was also partly hanging, though none of the glass had fallen away from the fabric.

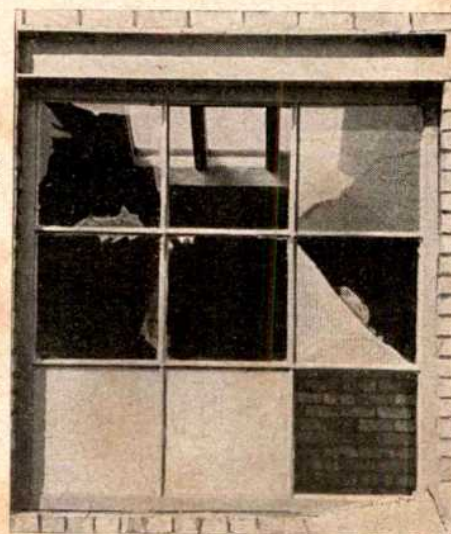
Third Test

With bomb at 20 ft. (equivalent to 500-lb. H.E. bomb at 80 yards).

The previously unbroken pane (G) with the anti-shatter cloth, was finally broken, and the glass in bulging had split the cloth several inches. No great change in the condition of the window was apparent except that what damage had been done was further intensified.

Conclusions

1. Three main points emerge from these tests: From the point of view of safeguarding against personal injury due to



See "Second Test"

ROOF NETTING

as approved in connection
with the

FACTORIES (GLASS PROTECTION) ORDER

Available From Stock

Complete ROOF PROTECTION Schemes

Carried Out

* * *

Also

CAMOUFLAGE

Pickering & Haldane's

Netting Specialists

**SOUTHAMPTON HOUSE, PELHAM ROAD,
CLEETHORPES, Lincs.**

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Telegrams : " Camnets "

suggested that it might be strong enough to hold together larger and thicker windows when the glass was burst by blast.

For this test a 7-ft. square of 1-in. Plate Glass was mounted in a test window and the netting applied to the inner surface of the glass by the manufacturers. Two widths were used, overlapping slightly down

a cumulative effect of three blasts at decreasing distances, the amount of glass which had fallen away was less than 2% of the total window area, and all the fallen fragments were lying either on the window sill itself or on the ground immediately below the window.

As a result of the third test the glass was left sagging rather badly and bulging inwards, supported entirely by the netting, still attached to the sides of the frame. The netting itself had been cut or torn in several places near the side of the frame, several of the cuts being 6 or 8 inches long. These cuts followed cracks in the glass, and had apparently been made by the sharp edges of the broken fragments as the glass moved inwards and outwards under the action of the blast wave. In many places the cuts were only prevented from being long continuous slits by the fact that the fabric had held

in one or two meshes.

Conclusion

The tests completely confirmed the point about the effectiveness of all flexible coatings: i.e., that their value depends on the *adhesion* and on the *inherent strength of the coating*.

The adhesion between the netting and the glass is of very considerable strength, even without a second coat of glue applied after the fabric has been fixed with the adhesive it contains as supplied. The fabric itself, also, is of ample strength, and it may be stated without reserve that when this fabric is properly applied it should offer all the protection that can be expected of any material for simple application to the surface of glass. The degree of protection is, in fact, of a very high order.



See "Third Test"

the window, and the netting was carried over the frames for about 1½ ins. all round. In addition to fixing the netting to the frame by the adhesive with which it is supplied impregnated light wooden fillets were sprigged into the frame immediately behind the glass. The object of this was not to provide additional support to the glass but simply to ensure that the netting would adhere properly to the wood without risk of its curling or shrinking away from the wood during drying.

3 Tests

One each with bombs equivalent to a 500-lb. H.E. exploding at 120, 80 and 40 yards.

After the third test, which represented

THE following has been prepared by the Research and Experiments Branch of the Ministry of Home Security for the guidance of executives and A.R.P. Officials in industry:

The function of protective walls is to give personnel protection from splinters, *not* from blast. The walls can be considered as of three general types—

1. Full Height Walls

Advantages—

- (a) Useful as fire stops.
- (b) Limit mild blast damage to roof.

Disadvantages—

- (a) May be blown down by fairly mild blast.
- (b) Will form missiles from a near hit.

Construction—

If essential (as fire stops) they might

be constructed in reinforced concrete or steel frames independent of shed structure, and so be rendered less likely to collapse.

2. Half Height Walls (6ft.—8ft.)

Advantages—

Give necessary protection to machinery or plant specially vulnerable to splinters.

Disadvantages—

- (a) Will form missiles from a moderately near hit.
- (b) May be blown down by fairly mild blast.

Construction—

As their function is to protect plant these walls should only be built in box form or three-sided. This will make them more resistant to collapse.

3. Dwarf Walls (2ft.-6in.—4ft.-6in.)

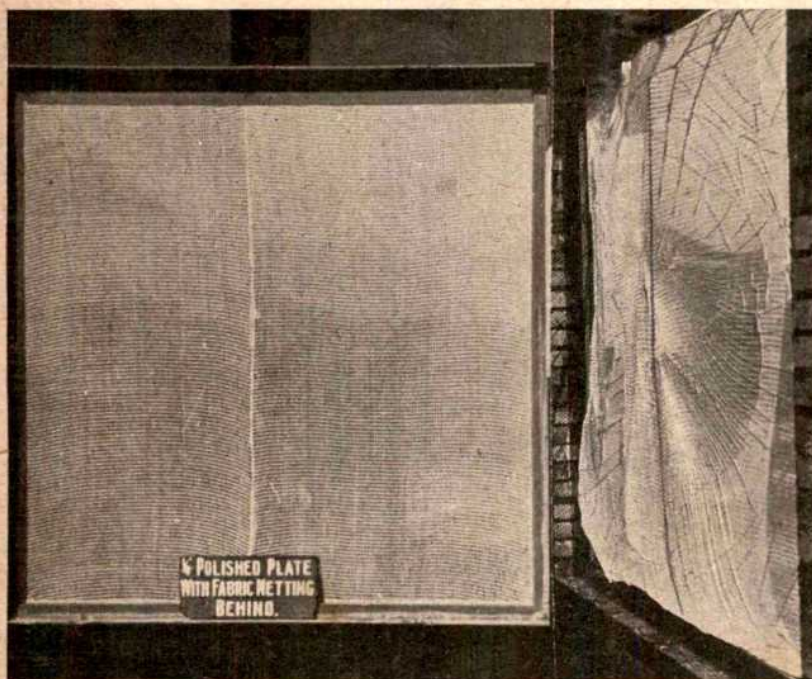
Give necessary protection to personnel and some to plant.

Working Through Raids

IN one concern where it is the practice to have one warden on duty to every ten people at work in the factory we were told that the dwarf walls were found most useful. In this works it is each warden's job always to see that there is a place for each of the ten employees in his group to duck into when necessary. The dwarf walls, a warden said, seem to be first choice among the hands.

Camouflage

THE voluntary camouflage of industrial buildings is officially encouraged. Executives find however that, owing to weather action, most forms of camouflage do not last long, being effective for only a few months. It is therefore, a recurrent expense. In addition, the necessary paint, distemper, etc., often cannot be obtained in sufficient quantity. We should be glad to hear from readers on this point of camouflage. What are your views about



This plate glass window was hit by three successive blasts of increasing violence (see text above). Right hand side view shows it stood up well.

6 foot-candles minimum



(5th REPORT OF THE DEPARTMENTAL
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it, or what are your experiences?

Red Flags

A GOOD many firms are now hoisting the red signal flag from their roof-tops to act as a local danger warning for anyone round about who cares to see it. Use of the flag, of course,

depends on competent spotting. Not all firms can have competent spotters so those who are lucky and provide the signal flag for others are performing a much appreciated service.

We know of several neighbourhoods where small firms are able to carry on through alerts because of accurate guidance from the signal flag on the roof

of a large factory nearby.

Coal Danger

THE dropping of bombs into large stacks of coal can initiate heating-up that may not be detected for many days. This is therefore a special point that A.R.P. units should watch.

Burn Your Wood Waste and Make These Two Economies . . .

THE disposal of wood waste has become increasingly difficult in the last year necessitating a recasting of current practice. Wood waste cannot be allowed to accumulate in sawmills and factories. Even a day's waste if not removed would noticeably slow production, while a little more would choke the entire productive machinery and bring it to a standstill.

Sometimes waste of this type is carted away for dumping or—more usually—wholesale incineration. This procedure has the disadvantage that shavings, by reason of their bulk, form uneconomic loads since a lorry load does not fully use the vehicle's capacity. Consequently the cartage contractor has to charge at a rate higher than for handling less bulky material.

To-day the position is aggravated; many vehicles having been withdrawn from service it is sometimes next to impossible to get material moved at all. Again, those contractors who used to burn such waste on large open dumps have to make other arrangements in many cases owing to defence regulations.

As a result there has been increased interest in economic methods of small scale incineration, and improvements have been made in the disposal of wood waste by burning in furnaces.

The wood refuse destructor shown here has been adopted widely since its recent introduction. It consists basically of a mechanical hopper feed and a combustion chamber in which the chips are burned.

How The Unit Works

The hopper receives shavings, sawdust etc., generally collected by a cyclone from the workshops. The waste is then metered from the bottom of the hopper by a drum with obstructions on its surface turning at between three and twelve revolutions per minute. The chips then pass into an air stream set up by a blower delivering air at a suitable velocity and volume according to the quantity to be dealt with, and subsequently into the ductwork and combustion chamber of the furnace. The meter drum is driven by a 1½-H.P. motor through a croft's variable drive, while a similar motor drives the blower.

The air-borne shavings impinge in the furnace on a refractory brick bridge so that they are thrown up and back, being burnt while still in the air. The design of the chamber provides complete combustion of the waste at about 15 feet from the feeding point, the products of combustion taking the form of high temperature gases, reaching a temperature of about 1,200 deg. centigrade at this point.

The capacity of the units is governed

1. *Cut Out the Cost and Delay of Removing the Waste*
2. *Have Ample Free Fuel For Use In Your Own Boilers*

This New Wood Refuse Destructor Makes It Possible

by the air speed and the meter drum speed, while it is increased by the embodiment in the design of an adjustable lip which, by reason of its position in the air stream, produces a vacuum effect which draws the chips by suction.

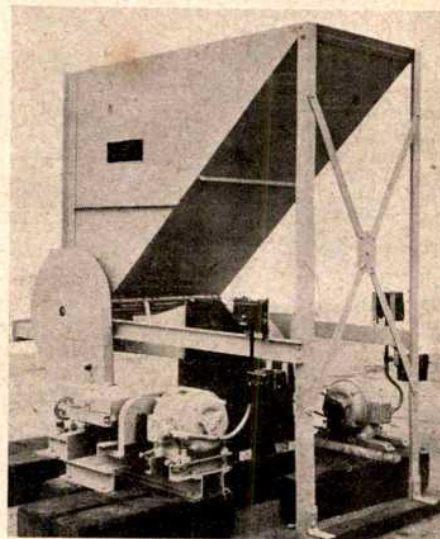
One and a half tons an hour can easily be dealt with by a standard unit. These units will take up to 10% of sawdust with the chips. It is under some conditions inevitable that occasional pieces of wood too large to pass the meter drum will be deposited in the hopper.

To prevent such material from jamming and damaging the loader a spring loaded trap is provided. This is forced open by any piece of wood too large to pass. The unit in fact is foolproof, requiring the minimum of attention.

This type of unit has been installed at many sawmills, timber works, and other woodworking firms throughout the country.

Cost And Savings

As the 1½ ton per hour installation costs about £1,500 to instal and requires little maintenance the saving on cartage amounts to a good return on the capital outlay, taking an average output of 1 ton per hour for a 50-hour week. For comparison the cost of removal can be taken as 10/- a ton (including handling in sacks) entailing an outlay of £25 per week, and at this rate the cost of an incinerating plant of this type would be covered in just over a year.



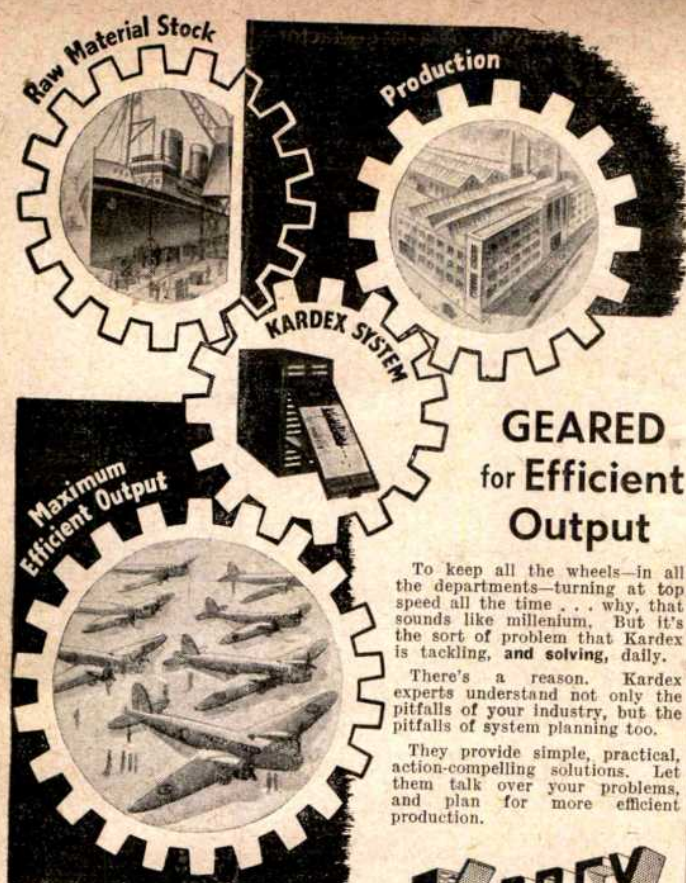
This comparison assumes that no use is made of the products of combustion in the furnace. In fact a waste heat boiler can produce 6,000-lbs. of steam per hour on a consumption of 1½ tons.

The British Brush Co., for example, have for some years obtained practically all their power from return tube boilers in a waste heat furnace fired by chips and shavings.

At one time the furnaces were fed by hand, shavings being collected from a cyclone system in two pounds at the entrance to the furnace room.

A 1½-ton Stoker was installed, feeding one of the two furnaces by suitable ducting, and their experience shows that the plant fired by these Stokers will only require the attention of one furnace hand, where formerly two were employed.

Thus the unit can be equally useful as a stoker for existing furnaces or as destructor plant.



GEARED for Efficient Output

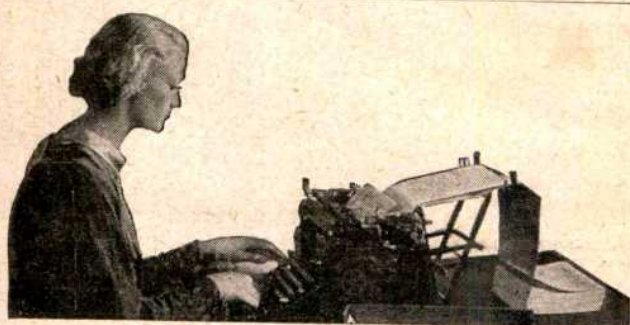
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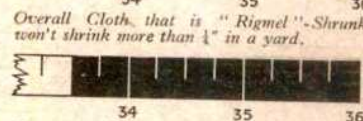
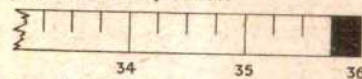
THE Army knows that men can't fight properly in shrunken clothing.

That's why, when the Home Guard overall cloth was ordered by the Army, the suppliers were told that it had to be commercially shrunken to a certain standard. The cloth has to pass an official test under which it must not shrink more than half of 1% in length or 2% in width.

These tolerances are also associated with many civilian cloths in "Rigmel"-Shrunk. "Rigmel" was already the most widely used commercial treatment in Great Britain for controlling the shrinkage of cotton cloth, so it may now reasonably be regarded as an accepted standard.

If reliably shrunken overalls are essential to the Home Guard they are essential to your workers.

The diagrams below show the difference between "Rigmel" and some "unshrinkable" finishes on the market. They also explain why the Army specifies particular shrinkage tolerances approximating to the "Rigmel" standard practice.



"Rigmel"-Shrunk

REGD.

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become entirely molten metal within 60 to 90 seconds of falling. That is quite a long time—time enough to run to the spot and to go into action with a FIRST AID APPLIANCE.

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NOTE. You can work CLOSE to the Bomb with the R.S.Q. and can use it single handed. Also, unlike a hand pump, there is no danger of ELECTRIC SHOCK if live wires are hit by the jet.

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Quicker Collections

(Continued from Page 20).

tor had inserted the debit balance, automatically reduced the outstanding balance. Finally comes a small item of 6s. 6d. supplied from our Glasgow office, making a balance at that date of £72 6s. 6d.

On the right-hand side of the statement will be found an Account Ref., in this case "Hen." This, I think, is peculiar to ourselves and might be found useful to other firms as a check against wrong postings. Where there are a large number of accounts there is often a probability of duplicated names. By using a reference which refers only to surnames we eliminate possibility of error.

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In these days when staff movements are likely to be so uncertain we trained two other young women in the operation of the machine and the system. Thus we have two qualified deputy operators to supplement the regular one. In this way we guard against delays or hold-up that the present unpredictable situation may cause.

As in every other phase of specialised work proficiency is not maintained without actual practice. Knowing the theory and the principle is not enough, speed, dexterity and accuracy which is the outcome of constant practice is what is required.

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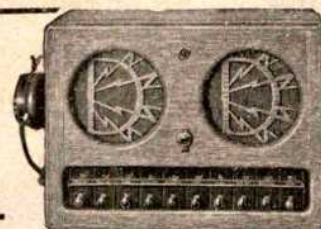
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Calculating Machine A Focal Point

Continued from page 22.

months in the schools, qualifying at the end of this period for a diploma of efficiency with which they can enter a first-class career.

On the other hand, where firms prefer that their staff should receive instruction under the supervision of their own executives, Sumlock teachers are sent along to train classes of girls in whatever types of calculation the management requires.

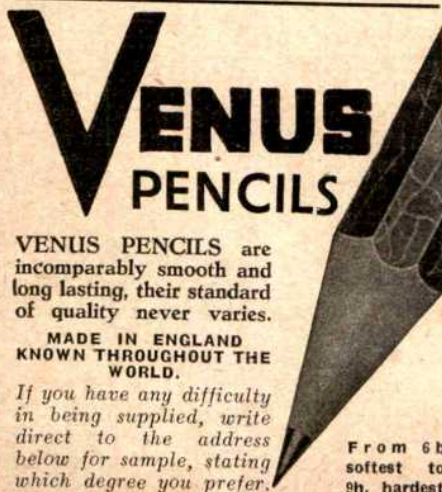
Alternatively, the girls can be sent to one of the schools for a short intensive course in any particular form of calculation.

All Sumlock operators are welcomed back to any of the schools for refresher courses whenever they choose to take them, and each of them knows that whenever she likes she can bring to her school's Principal any new problems she may have encountered, which means that she can always tackle any sort of work with a sense of security and confidence.

This is invaluable, not only when a girl is taken on to the permanent staff of a firm, but especially when she is sent out by the Sumlock Calculating Services on temporary jobs.

It is easy to appreciate just what this reliance on outside help can mean to harassed executives all over the country in abnormal times like the present.

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into it.

Furthermore, the fact that it is
manufactured in this country does
minimise such disappointments as
delays in delivery and servicing. Also
it overcomes the present growing
problem involving the dearth of
adequately skilled operators.

War Experience to Boost Post-War Trade

(Continued from Page 10).

the higher costs of printing to devise
for post-war times packages that are
even more attractive than were the
somewhat elaborate units used before
the war.

The pre-war packages consisted of
first a paper wrapping round the pro-
duct (a bottle) then a carton, and finally
a transparent wrapping.

The inner paper wrapping was
dropped altogether, then the carton,
which was formerly printed in four
colours was redesigned by an artist
for printing in two colours only. The
closure of the carton was improved and
the transparent wrapping abandoned.

The carton now, in its new and less
expensive dress, has greater eye-appeal
than its more costly predecessor.

The present sales of this particular
line of cosmetics have been much re-
duced but the publicity department of
the firm is busy devising full ranges
of advertising and dealer-aid display
matter on the basis of the new pack-
ages for post-war business.



"Public Relations"— To Retain Goodwill

IN the knitted textile trade a firm that
has gone over largely (but not
wholly) to Government work has
adopted a sort of "public relations"
policy to keep in contact with, and to
retain the goodwill of, its many custo-
mers and prospects.

It has issued a monthly bulletin,
distributed by post, bearing a well-
written commentary on its war work
and explaining how, through this war
work, it has been able to hold together
its skilled staff who will at once revert
to serving again old customers and
new ones the moment conditions permit.

Calamitous as it is in many ways—
in most ways, in fact—war can be made
to yield some permanent benefits. Astute
executives will therefore keep a con-
stant eye open for assets that can be
taken from their war experiences. War
is a remorseless driver; in a few
months it often forces developments
that normally would take years to
reach.

These forced achievements are in-
dustry's chance: seize them and use
them for future prosperity.

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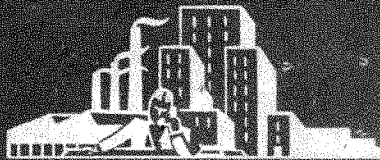
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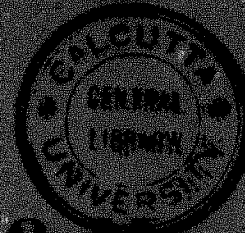
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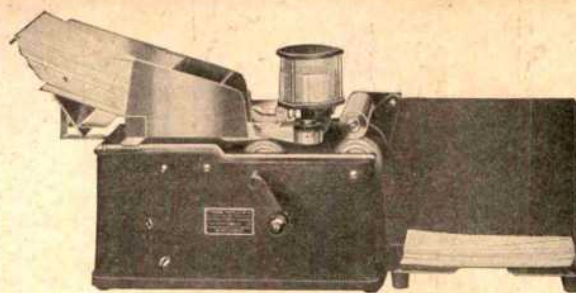
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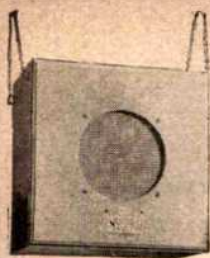
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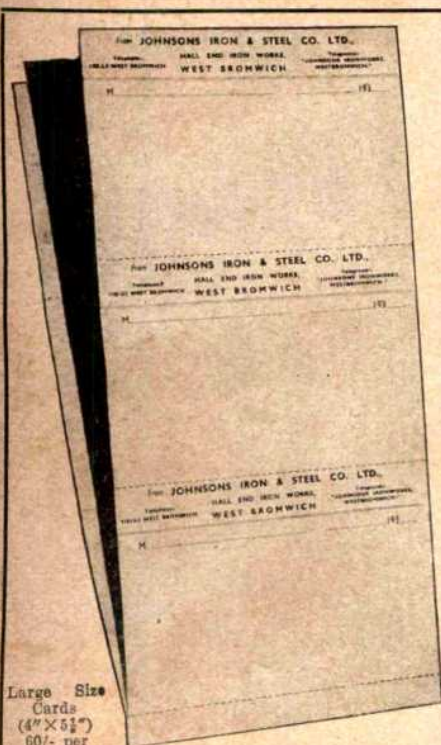
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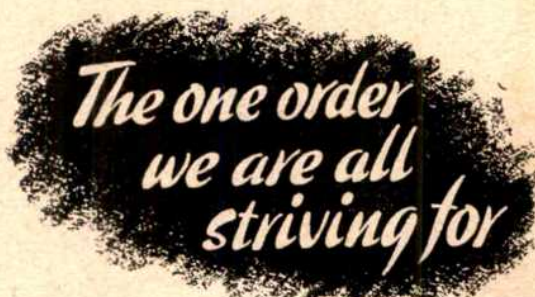
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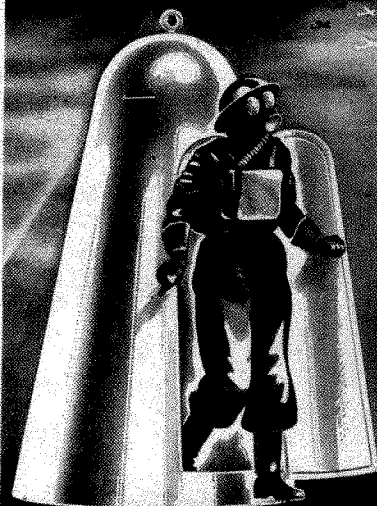
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"System", "Business Organization and Management"

MARCH, 1941

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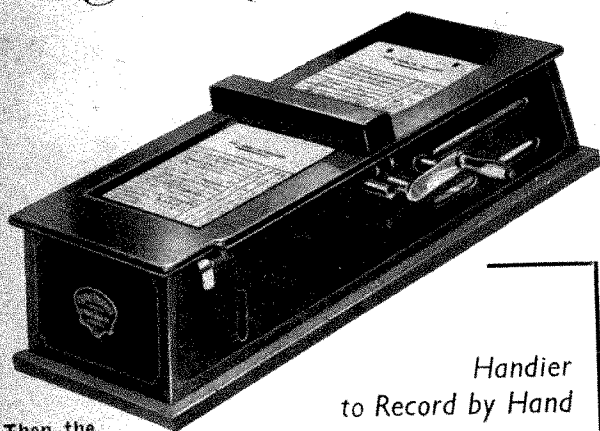
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By **RAYMOND STREAT, C.B.E.**

Chairman

The Cotton Board

A Vigorous 6-Point Plan For After-the-War Industry

THE Cotton Board, set up by Act of Parliament, is composed of three whole-time members—Chairman and two Executives members—and nine other members. All are appointed by the President of the Board of Trade: of the nine part-time members there is one chosen on the advice of the organization representing spinners, another from the manufacturers, another from the finishers, another from the merchants, and the fifth and sixth as respectively representative of rayon and raw cotton. The remaining three are chosen from the operatives in spinning, weaving and finishing. One of the Executive members must, under the Act, have experience in a producing section, the other in merchandising and distribution. This compact body holds meeting every fortnight and extra meetings as circumstances require. Every member gives much time outside of meetings to the work of the Board.

The Board's Main Task

The Cotton Board itself is a united entity and one of its greatest tasks must be to bring about an interlocking unity of thought and action between all the diverse sections which make up the industry, whilst giving always the fullest scope for the individual initiative

and energy which are amongst the best of the inherited talents of Lancashire folk.

The course of events during the rest of the war will inevitably necessitate more rather than less control in the cotton trade. Control is impossible without forms and regulations or without severe interferences with private freedom. There will be more control of materials, more control of prices; there may have to be control of persons and property.

These things are anathema to the independent people of Lancashire. Much valuable time and energy has been wasted arguing about them, and even in some cases arguing against them. We shall do well to remind ourselves of the kind of control our enemy would impose upon us were he to defeat us. Let us extend the fullest co-operation to the milder controls

Though he speaks primarily to the cotton industry Mr. Streat puts here, in a nutshell, the basis of a powerful, specific policy applicable to *any* industry—or even individual business. And its keynote is **ACT NOW**

which are one of the prices of victory.

In my view, the greatest service which the present war-time Cotton Board can render is to engage in a number of experiments in reformed internal and external procedure. If these experiments prove that the ideas on which they are founded are wrong and faulty, nobody will be greatly the loser, because war-time taxation seizes all profits and it is no great matter to add a minor risk or two to the perils which surround us in any case during the war. If the experiments prove successful, they will give us the outline of a sound post-war policy.

Is Lancashire Efficient?

It is misleading to-day, as it was before the war, to talk at length about reform, re-organization, and so forth. The obvious implication for the un-

informed person is that the Lancashire cotton industry is in some grave way inefficient or out-of-date.

I claim that in Lancashire we possess more than any other area in the world examples of highest efficiency in the cotton trade—efficiency of operatives at their particular jobs, efficiency of mill construction, equipment and management, efficient sales organizations. I couple that with strong and urgent advocacy of certain reforms aiming at a greater *total* efficiency.

The Deadheads Always Challenge Progressiveness

Those who hate all change, those who have their own reasons for desiring no changes to take place, or those who want the other fellow to change whilst they themselves are left alone, will quote my own words against me when I urge them to be up and doing in the matter of reforms. If I advocate reforms, how can I prevent the Government saying that even this industry's own spokesmen tacitly admit inefficiency: how can I prevent enemy propaganda using my statements to detract from our reputation: how can I persuade customers not to jump to the conclusion that Lancashire is obsolete?

The contradiction is more apparent than real.

First of all, from the customer's standpoint, all talk of reforms, re-organization, and so forth, may be disregarded: keen buyers judge by results. Up to date, our customers all over the world have been given good value in quality, design and style so much so that our goods are sought after in preference to others even at higher prices, providing the margin is not too great.

From the standpoint of the Government, if I make high claims for our efficiency, it is not inconsistent in the actual circumstances of the world textile trade to insist simultaneously upon the need for more and more assistance and support: under the conditions of to-day and to-morrow, efficiency of individual units is not enough to ensure industrial prosperity—basic conditions must be so arranged as to give scope for efficiency, and basic conditions are the responsibility of the Government.

Thirdly, from our own internal standpoint, if I tell an operative, a spinner, a manufacturer or a merchant that changes are desirable, I am not at all implying that he has been or is inefficient. Each unit may perform its present function to perfection and yet the outlook for the trade as a whole may remain bad. You can have, for instance, superbly efficient spinning, and make losses in the spinning section which even the greatest imaginable economies including wage reductions would not transform into profits. You can have efficient selling and distribution under a "*laissez faire*" system: efficiency which no fair-minded person could criticize: but if the trade yields neither satisfactory wages for operatives nor fair profits for producers, the mercantile efficiency is worthless from the standpoint of the community.

You can have skill on the part of the operative, the equal of which is not to be found elsewhere in the world: but if the system on which wages are paid (apart from the receipts of each wage earner) result in prices being wrong from a market point of view, in the final analysis

the great asset of operative skill is being largely wasted.

The Cotton Board is out for a new and better co-ordination of the activities of the several distinct sections which comprise the industry, but I entirely rebut and resent any suggestion that this implies that Lancashire is or has been inefficient.

It is hard to think and plan for the post-war struggles whilst the war remains to be won. But it is vital that we should do so. Would that this nation had looked ahead well enough before the war!

Amongst a host of dark uncertainties, one of the most profound is to the future basis of international exchange. Internal inflation must be stopped and surely will be stopped wherever it rears its ugly head. We must count on exchange control in some form or another for a long time after the war. Anybody's guess is as good as another's. Mine claims no expert knowledge or inside information. But, I think governments will be obliged to cope with the post-war chaos by organizing and controlling the exchange of commodities to the volume and value of the exchange facilities available or creatable.

Price And Quality Will Still Matter

The Lancashire man may be tempted to say this would be fine—we shall only have to make our government make the other governments take our cotton goods and prices won't matter very much. Unfortunately, I cannot see things working out that way. There will be still a world surplus of productive capacity in the cotton industry. True, some markets will have been starved for a long time. Some enemy countries and some occupied countries will have lost their former trade connections. But the great cry will be for constructional and capital goods, and

in the inter-governmental trade bargains which I envisage, the other countries will agree to take cotton goods from the United Kingdom only if our prices and qualities are attractive. Otherwise they will turn to their trade agreement with some other country to fill their cotton needs.

So it comes to this: though everything changes everything is in some respects the same, and our prospects for export trade in the post-war future will depend on price and attractiveness, as they did in the past. The difference, I think, will lie chiefly in the fact that for a long period international trade will have to be specially controlled and organized. If I am right in this, our industry will have to put itself in a position in which it can play its part in an organized manner. That is no easy thing for it pre-supposes an entirely new regime in Manchester and Lancashire.

The immediate task remitted to the Cotton Board by Sir Andrew Duncan, and confirmed by Mr. Oliver Lyttelton, who succeeded him as President of the Board of Trade, is the care and promotion of war-time export trade.

The Cotton Board founds its plans and hopes on the belief that Lancashire has great assets of efficiency, trading connections, experience and resourcefulness. We know we cannot compete with the rest of the world by a wage competition. On the contrary, we want to make it possible for work in the cotton industry to earn better rewards than in the past. We are convinced that it is feasible to manage things so that by efficiency, economy and a selective price policy we can pay wages, make good profits and compete sufficiently to achieve the volume of export trade requisite for economic production by a suitably-sized industry.

I may put our plan before you as a campaign on six fronts.

The Cotton Board's Plan Is a Campaign on These Six Fronts

1. Government Front

We hope to get efficient, resolute and resourceful international trade agreements with a front seat for cotton goods every time. We look for facilities like Export Credits Insurance, which will have to be specially comprehensive during the post-war confusion as they are now under war conditions. We look for helpful arrangements in foreign exchange and a taxation policy which will facilitate modernization of plants.

All this will take a lot of getting. We shall need to speak with a united voice and our propositions will have to be backed with intelligent understanding of the technical problems involved, as well as with sufficient political weight. We think Lancashire will find it valuable to have a central body to speak and act for it in these matters, and that given unity and energy it is safe to count on substantial contributions from this front.

2. Price Policy Front

Circumstances will compel further price control during the war. But the Cotton Board is convinced that price control will be equally necessary *after* the war. Lancashire cannot afford either flamboyant profit making in temporary periods of

keen but possibly artificial demand, nor selling at a loss when demand slackens. A free market leads inevitably to both these things, and both are evil.

We do not suggest that we are yet capable of conducting a policy of managed prices with the skill which will be called for after the war. We do not claim perfection for what has been yet done in this field or what we may shortly do. We regard steps taken during the war largely as experimental. But we do claim that without price control, a future of commercial stability and continuous technical progress is impossible.

Managed prices confer enormous benefits on the producers, and in return for these benefits they will be called upon to do much. Obviously they sacrifice some of their former liberties. But they must do far more than this. By freely granting derogations they must lend force and power to our export offensive. They must solve once and for all their own redundancy problems. They must participate boldly and courageously in technical advancement and they must co-operate with labour, not defensively for the sake of their individual balance sheets but aggressively for the good of the industry and for the strengthening of its competitive striking power.

I hope every millowner or mill manager

who hears or reads these words will take them into serious consideration. I, for one, will not be a party to the perpetuation of price protection for producing sections which stay in the dug-out thus provided for them and do nothing to contribute to the general campaign.

3. Commercial Policy

Here the problem is the adjustment of mercantile practice to the new conditions. It is a tremendous problem even to adjust mercantile practice to a regime of managed prices in producing sections and on top of that, the merchants and the Cotton Board together must find the answer to the many hard and painful questions which will arise out of the post-war situation in international trade to which I have already alluded.

I have already told a meeting of export merchants that it is no part of the plans or ideas of the Cotton Board to supplant or replace them. I firmly believe that a large and prosperous community of export merchants is indispensable to the productive industry of Lancashire if we are to maintain a satisfactory export trade after the war.

Our policy is definitely to preserve and protect the merchant function, but in return for this the merchants must play their part. Their whole tradition and outlook is undoubtedly opposed to any system based on controlled prices. Many of them have been trying very hard to co-operate with the Cotton Board in recent months, and I gratefully acknowledge the help we have thus received. But as a section they have either to find answers to all the problems of adjustments involved in the new conditions towards which we are moving, or they will be superseded, not by the Cotton Board, but by the force of circumstances.

In many other trades, price is compounded of two factors—cost pure and simple and what the market will pay. The Manchester merchant throughout his long past services to the industry has always tried to buy at the lowest price and to sell just below his Manchester competitor. Henceforward, the only hope for the industry lies in differential prices, in which the factor of what the trade can bear is brought in. Where the trade will bear a profitable price, the producer must not be robbed of profits by internal market pressure. Only thus can the producer sell cheap where the trade will not bear the higher prices. We are moving with cautious but determined experimentation along these uncharted paths. In the next few months we shall be able to see what lessons our experiments have taught us.

Perhaps our principal experiment is to be found in the activities of British Overseas Cottons Limited, a company set up by the Board of Trade because of Sir Andrew Duncan's personal conviction that without an instrument of this kind, the Cotton Board's export drive would be all words and no action. Mr. Frank Platt was appointed by Sir Andrew to the Chairmanship of the Company and his boldness in vision coupled with his energy in action will ensure striking results. He works hand in glove with the headquarters of the Cotton Board.

Besides British Overseas Cottons Limited we have been experimenting with what may be termed voluntary verticalism in the form of export syndicates, and our minds are always restlessly searching for any new form which will bring the efforts of the diverse sections into greater unity.

4. Technical Progress

I believe we have one of the best research organizations in the world in the Shirley Institute. I believe it has reached a stage at which it can be relied upon to produce invaluable technical and scientific proposals in more or less regular profusion. These must be exploited to the full. Lancashire must have the benefits and not the foreigner. No conservatism must stand in the way. If adjustments of labour arrangements are involved, they must be faced. Price control must be so managed as to encourage producers to adopt new inventions. All this can be done by an active as opposed to a passive policy.

Naturally, the research institute itself must not be interfered with. The independence and integrity of the scientist must not be violated. To do so would be a fatal error. But the Cotton Board must see to it that the labours of the scientist are not neglected by reason of lack of appreciation of their significance, by conservatism, by opposition from parties interested in the *status quo*, or by lack of finance.

5. Labour Front

This is a subject on which I speak with a certain diffidence, but in this as in all things I must speak my mind and accept the consequences of so doing.

I do not think our labour arrangements are satisfactory. There are many workers in our industry whose wages always have been too low and are so today. On the other hand, many of the established operative functions are performed too expensively having regard to mechanical improvements which are now available.

The basis on which wages are negotiated is in many respects out-of-date, and this constitutes a barrier to technical advancement. I feel that both the Trade Unions and the employers' organizations are open to some reproaches in this matter. I know the difficulties are great, but, all the same, anomalies have been left too long unattended to.

It is a fact that juveniles are avoiding the cotton industry and have been doing so for some years past to an increasing extent. We must make employment in the cotton industry attractive bearing in mind that henceforward there will be other industries besides cotton in Lancashire to an increasing extent.

I do not think the Cotton Board should interfere with, much less supplant, the organizations already existing whose function it is to deal with labour and wages questions. I refer to the Employers' Federations and the Trade Unions. But I certainly think the Cotton Board is entitled to enquire into these matters and to use its central authority to facilitate progress.

In an emergency arising out of the war, we are already doing something in this field. I refer to our action in appointing Sir Cyril Entwistle, M.P., and Mr. George Tomlinson, M.P., to enquire into shortage of labour amongst certain government contractors. This friendly intervention has had some good results and I trust our help will be accepted similarly in other directions.

6. Sales Promotion and Market Research

Here we are entirely without precedents to guide us. Nothing at all has been done for the community as a whole in these

matters in the past.

Individual firms have done much for their own businesses and with great advantage to themselves, but the cotton trade as a whole, apart from one or two rather half-hearted ventures in exhibitions, has not done anything in these very modern fields of activity. The Cotton Board is experimenting with a good deal of boldness.

At this moment, with the support of some twenty-five leading Manchester merchants, we are conducting a unique advertising campaign in the Argentine—one of Lancashire's most important markets. Already we have reports which convince us that this venture will handsomely justify itself.

In U.S.A. we have appointed a whole-time Market Consultant who is not only helping Lancashire firms to sell more of their old-established lines and to cultivate entirely new lines, but is also providing a remarkable service of stimulating technical and market information.

We are represented with the British Trade Mission to South America. Sir Kenneth Lee is a member of the Mission and has a Cotton Board man with him, sent out by us to ensure contact and the fullest exploitation of all possibilities.

We have had a representative in South Africa and another in Java.

Last, but not least, we have established what we call "The Colour, Design and Style Centre" for the British cotton industry. In the midst of war we show our faith in the future and our realisation of the increasing importance of fashion and style.

The sixth front will be a lively one from which much of benefit will unquestionably be extracted.

The Chances of Success

I trust you will find a good deal which sounds sensible and progressive in what I have been saying. But you may nevertheless ask how far all this is going to go, when all is said and done, in creating prosperous and stable conditions after the war for the cotton industry.

Well, that is and must remain a matter of opinion. The Cotton Board has the assistance of some of the best brains in the trade. We have expert statisticians. We have surveyed the possibilities of the markets overseas: we know something of all the difficulties which have to be surmounted.

Perhaps I am by nature inclined to optimism, but the conclusion I personally have reached is that within five years, and possibly in a shorter time, given support, we can achieve the goal in view by a steady development of the policy which the Cotton Board has adopted.

The main chance of success and the main risk of failure lies in ourselves; in the rank and file of the Lancashire industry on the one hand, and in their leaders on the other.

Under such circumstances, no doubt, minor mistakes will be made and minor injustices inflicted. That is inevitable. No advance has ever occurred in history, in any field of man's activities, of which this could not be said. But if the policy is right and the leaders in charge of it well chosen, mistakes can be rectified, injustices relieved. And in a broad forward march such incidents will be of small importance compared to the enlarged opportunities which will be there for everybody to seize if they have the energy and resource to do so.

The above is extracted from Mr. Street's address last month to the British Association of Managers of Textile Works.

MANAGEMENT NOTES

Scotch This War Alibi . . .

"SORRY, but owing to war conditions we are unable . . . etc."

For a countless number of failures to be able to do this or that the war is, today, a perfectly true reason. Supplies of everything are short and uncertain, transport is upset, labour unpredictable.

But do not let us succumb to a danger. Do not let us absorb too deeply this alibi for not being able to do things. Already it is being used as an excuse for a number of failures for which the war is *not* fully responsible.

In general it can be quite truly said that business routine is difficult and below par but there are nevertheless very many specific instances where correspondence is being held up, orders delayed or bungled, appointments missed, little acts of service neglected or performed in a slipshod manner when such things are not necessary at all.

There is arising a really serious danger of not bothering to do our best because it is so easy (and so necessarily acceptable by sufferers) to put forward the excuse of difficulty and upset due to the war.

It is not fair to ourselves to get into this way or to allow this slackness to fix itself on our staffs.

The war will not last for ever. The

time may be nearer than we think when enemy action will cease and official bans will be progressively lifted. If we get deeply into the state of mind that permits slackness on the grounds of uncontrollable circumstances we shall be in a bad way when the alibis are removed or made less generally acceptable.

Precaution: Keep Fire-Proof Cabinets Shut

GUARANTEED fire-proof cabinets are essential these days for the protection of vital visible index records. But the tendency is, especially in big departments where constant references are being made, to leave the trays in the "out" position during the ordinary day's work.

As part of its A.R.P. one large firm that we visited last month has prohibited this. A strict rule has been imposed that anyone referring to a "visible" tray must replace it immediately after use and close the cabinet. In modern cabinets the heavy door is counter-balanced so that closure needs no

It is a definite fact that, in detail, many businesses could be more closely held together than they are being kept at present. Whereas it is obviously impossible to trade on a pre-war scale it is still possible (and urgently desirable) to maintain goodwill—even to *extend* it. And this *can* be done by paying a lot more attention to the little details that matter: by fighting against that dangerous anodyne the war-alibi.

vigorous effort.

This rule is not only a great extra safeguard for the records but, in case of emergency, it enables personnel more quickly to get to safety. They do not have to stay behind to close anything up to fifty fire-proof cabinets.

Export Credits Change of Address

THE Export Credits Guarantee Department announces that the London and Southern District Office has been transferred to:

3rd Floor, North West Wing, Bush House, Aldwych, W.C.2.

The telephone number is TEMple Bar 7622.

For All Industrial Buildings Here's Something New in Camouflage

IT cannot of course be sweepingly asserted that the popular idea of camouflage executed in patterns of coloured paint is of no use whatever. It is a fact, though, that this form of defence for industrial buildings often misleads and satisfies the user to a far greater extent than it confuses and disconcerts enemy airmen.

Taking up his stand for a distant survey the factory owner may critically regard his newly camouflage-painted factory buildings and draw confidence from the fact that, to his eye, they merge so beautifully into the surrounding land. "You'd never know they were there . . ." he remarks confidentially to his friends. And, true enough, the long assembly sheds really do look like part and parcel of the surrounding landscape: even the boiler house and its chimneys want some picking out. The camouflage artist has indeed done a good job.

Unfortunately, however, the hostile spotter, with his telephoto lens cameras, haze fitters and other wizardry for high-altitude photographic survey is not much put off by the colour blending skill of the paint artist. On the contrary, he is often aided by such careful colour work.

What, for example, do you think is the conclusion arrived at in the enemy's projection room when their big enlargements reveal a shadow which accurate scales tell them must be cast by something at least 300 feet long by about 90 wide when, to all appearances, nothing is there to throw such a shadow?

Their conclusion is instant and unanimous, leading to the prompt and definite order, Bomb The Shadow!

Now, based on a principle which is the direct opposite of trying to draw a veil between the hostile airman and the factory building on the ground a new system of camouflage, already proved uniquely successful, actually *seeks* the attention of the penetrating camera. In fact the more clearly the hostile lens can record the building camouflaged in this new way the better for the subsequent safety of the building.

That may sound paradoxical, yet behind the seeming inconsistency is a basis of simple fact that, if we were free to divulge it here, would be universally recognised as the most obviously effective measure.

The development of it is due mainly to one man's quick adaptation of ideas and is

a little romance in itself. It is much to be regretted that censorship prevents its publication here.

However, this at least can be said. For years there have been men specialising in creating this type of camouflage though most probably they have been completely oblivious of the war-time potentialities of their medium.

A small corps of these experts has been gathered together into a mobile working unit. For industrial buildings in any part of the country a survey for this new camouflage can be made and work started at once.

Cost, of course, cannot be arbitrarily stated, but it compares favourably with that of an ordinary colour-painting scheme. As a rough guide it might be considered that £1,500 would be about the figure for the average £8,000 to £10,000 factory building. And in assessing this figure the vital importance of the far higher safety factor which the new system introduces must be borne in mind.

It is not possible at present to give the name of the organization carrying out this new work, but to any enquirer we give the London telephone number.

This man is a wizard at identifying aircraft, but he doesn't do it by trying to recognize constructional details of planes. "It's how they 'sit' in the air," he says, "you can tell in a flash . . ."



Weekly Man-hours Lost Totalled 25% . . . But

Spotters Cut It to Point-Seven %

M. R. Morrison's "Go to it" slogan was appropriate at the time he urged it, but when the Nazis adopted air-raiding on this country as an almost whole-time job a more necessary injunction for our industries to observe became—"Keep at it."

Without a properly planned system of trained spotting we could *not* keep at it. Our company is a big engineering concern; we have something over 3,000 employees; and we are fully occupied making vital stuff for the war effort. When enemy raids started seriously, however, our loss of man-hours in the factory was serious too; many weeks it was as high as 25 per cent. At every "alert" the whole factory personnel went to cover.

Our planned spotting system soon altered that. Since it was inaugurated at the beginning of the winter our average weekly man-hour losses have been reduced to a *fraction of one per cent*.

Overground Personnel Shelters At Every Exit of Factory

Our shelter system consists entirely of over-ground blockhouses, very heavily built of brick and reinforced concrete. They are located near the various exits of the factory so that personnel evacuating at the order of the "danger imminent" signal can get quickly to cover. In fact the 3,000 odd employees can all get to cover in just under five minutes.

This Plan Enables Quick Evacuation To Be Made

This quick evacuation could not of course be made without a well

This company has 3,000 employees. It is one of the best known engineering concerns in Southern England, but for obvious reasons its name and location cannot be revealed

*This article was written from an interview
with THE CHIEF SPOTTER*

organized plan in which everybody knows exactly what to do and where to go.

Each section in the factory has its allotted shelter, which is numbered, and the route to each shelter is marked by a clearly identifiable coloured line. Each foreman or charge hand has, permanently fixed to his desk, a plan of the entire factory with the route and location of his own allotted shelter picked out in its identification colour, and all workers allocated to the shelter under his charge are given a similar plan, *for which they have to sign a receipt*.

Thus every individual knows precisely his allotted shelter and the route leading to it.

Why We Don't Follow The "Work On" Idea

On receipt of the emergency warning *everybody* goes to cover; we do not try to discriminate between sections and have some parts of the factory remain at work in the acute danger period, even though they may be "key" sections. This is not because anybody here is afraid to work on in

the emergency: on the contrary, it is because we find that this arrangement is the best; it gives the greatest possible protection to valuable workers and actually results in very little loss of work in the end.

In factories that have production departments located on several floors it is quite understandable that key workers should remain at work because of the comparatively long time element involved in evacuating and returning to upper floors.

Our factory, however, is all on ground level and spread over a very wide area of ground. No department, therefore, is many seconds away from its appropriate shelters. The four to five minutes necessary for total evacuation includes all the administrative and office staffs. Many of the factory workers can be in and out of their shelters in a matter of seconds.

Another point is that our roof-spotters are now so expert that the number of emergency warnings they give is exceedingly small.

Our rule, therefore, of everybody to cover if "acute danger" sounds is the best arrangement for our particular factory.

We have, of course, departments

that must not be left: for instance our heat treatment shop, engine test shop and power house. Special shelters are built into these departments. The staff file into them and can continue to watch their work through armoured windows. These shelters are fitted with a telephone system connected direct to the roof-spotters on duty so that if a key man wants to leave one of these shelters to attend to anything in connection with his work he can first ask the roof-spotters how things are.

Spotter Team Arranges Its Own Times On

Our team of spotters consists of twelve trained men who work in pairs for six-hour periods covering the whole twenty-four hours. Two spotters are always on duty at the look-out post on the roof. During non-alert periods only one of these two is actually on watch, the other rests in the well appointed cabin located alongside but he joins his colleague when a "yellow" comes through.

At no time is the look-out post empty, we have had enough experience this winter of the tip-and-run raider dropping suddenly out of low cloud to risk any other method than a trained spotter constantly on the watch.

"Spoken" Warning Best But We Can't Use It

At this point it might be mentioned that we are definitely in favour of the spoken voice as a means of warning the personnel. When this voice comes from a responsible guard whom everybody knows and trusts it is infinitely preferable to mechanical signals.

Unfortunately, however, our shops are so noisy that speech would lose all its value by becoming distorted and vague in the mechanical din that prevails. The obvious alternative therefore is a simple signal system, and we employ the following:—

1. On the receipt of "yellow" the second spotter joins the first on duty.
2. When the "alert" is received a "wailing note" is reproduced by the loud speakers (L.S.) throughout the whole factory.
3. If, in spotters' opinion, it is necessary to get factory personnel under cover, they signal six short blasts or "pips" on L.S. The whole personnel then go to cover, average time taken is four to five minutes.
4. In the event of surprise attack, say from low cloud by dive bombing, the spotters signal an emergency warning bell through L.S. Personnel immediately lie down or dive to nearest cover.
5. When, in spotters' opinion, it is clear to return to work, this information is 'phoned to A.R.P. Control Room, the Chief Officer then broadcasts this information to the whole shelter system by L.S.

Selection and Training Of Spotters Vitaly Important

The careful selection and training of men for spotting duty is of the utmost importance. I myself took over the job of organizing our spotters because, frankly, it was felt that I had the qualifications. In the first place, I have for some years held a responsible position in our engine test shop so that I am well qualified, technically, to "listen" to aircraft engines and to interpret the information they give—for every engine *does* give information to the trained ear. Secondly, I have closely studied for more than twenty years the construction and other characteristics of aircraft.

We Do Not Identify Aircraft By Structure

It might be of interest here if I explain that I personally do not identify aircraft by details such as a pointed wing or by the cut of a tail-fin. By the time a machine is close enough to spot these things accurately it may be much too late. I recognise machines by their general "sit" in the air and by formation and manoeuvre. As an example, a few minutes before dictating these notes I picked up, with a pair of low-power binoculars, three so-called "smoke" trails that were invisible to the naked eye. Having located these trails I then took a look at them through our telescope, which is of higher power, and at once recognised the typical "sit" of three prowling M.E. 109's. They were over a spot at least seven miles away and at not less than 20,000 feet altitude. Now *that*, if I may say so, is good identification. I say it in no boastful way but to emphasise the standard of spotting that is really necessary if it is to be fully effective. All our spotters are being trained to reach this standard.

In training the spotters I always emphasise at lectures the great importance of their *writing down* the facts and notes that I give them. In fact I regard my lectures more in the light of dictation than oratory. Writing serves to fix points in the memory as well as providing matter for reference and learning in the intervals between lectures.

The Best Type of Men For Spotting

Our spotters are selected from men over thirty years of age, mostly about thirty-three to thirty-four, and are chosen for their mechanical knowledge, for their leaning towards interest in aircraft and for general temperament that enables them to make balanced but quick judgment from factors observed.

I consider it of little value to use men, however anxious and willing they may be, who have not this general aptitude and qualification for the job. It cannot be too strongly stressed that this aircraft spotting is no mere useful

service, it is an absolutely vital defence measure, as essential in the present kind of war as sentries in the front line trenches were in the kind of war that we knew last time.

To fill this vital and responsible job, therefore, men with the above qualities *must* be selected. This almost inevitably means that the men must be drawn from those holding the more responsible positions in the shops. In our case this fact at first caused some opposition from section heads and works executives generally as no executive, shouldering the responsibility of urgent output schedules, wanted to lose key men for some hours at a time. But the explanation is an obvious one: it is much better to lose a key man for a few hours at a time only than possibly to lose permanently scores or even hundreds of key men by enemy action.

Identifying Aircraft By No Means The Only Factor

And even if you are able to draw upon men who can identify types of aircraft, or who can be trained to do so with satisfactory proficiency, that is by no means all that is required. Considered, accurate judgments of what will, or will not, constitute danger can only be based on an understanding of additional factors such as cloud formations, general weather conditions, movements and tactics of friendly as well as enemy aircraft formations, action of A.A. fire, and so on.

First class training in these things is essential, and so is plenty of actual experience. I personally spend as much time as possible up in the look-out post with the spotters on duty catechising them all the time.

Tendency To Over-Caution Is Very Strong

At the beginning there was a great tendency among the spotters to "play safe" and to sound the emergency too often. True, the presence of enemy aircraft in the immediate vicinity brings home to spotters the heavy responsibility of having the safety of a great works and thousands of personnel depending on them. That is why men must be chosen who can carry such responsibility. But by constant training and by a really sincere application to the job our team to-day has reduced lost time in the works to an almost negligible quantity.

There still remains a problem: how to deal with the lone raider that pops down out of low cloud or that utilises days when visibility is almost zero. So far, our action on all these occasions has been right. Soon, however, we are to be linked up with the Observer Corps in the scheme organized by the Government through the use of A.A. batteries. This will be of the greatest assistance, as we shall be able to plot still more accurately the movement of enemy aircraft and apply such information to our own local conditions.

Sequel to "Aiding Families of
Employees in the Forces,"
Published Last Month



Ideas Used in 4 Busy Companies For Keeping Up Staff Morale

IN last month's issue (page 7) a well known company described the management's scheme for assisting the wives and dependents of employees who were serving in the Forces.

This was a well organized plan and had the wide objective of maintaining the wellbeing and morale of some thousands of people—a contribution of great national importance.

Many other firms are performing a similarly valuable service, though not perhaps by exactly the same arrangements.

Employees' Advice Bureau Gives Aid Of All Kinds

For example, one company has set up what it calls its Employees' Advice Bureau. This is a small committee of senior men representing management and factory and including the firm's welfare supervisor, who is a trained nurse.

The committee's duties are nominally what the title describes but in actual fact most of the help given is to employees' families, especially the families of men called away to the forces.

Though no regular money subscription is asked by the committee its chairman has, from somewhere or other in the past twelve months, dug up about £2,000 which has been spent in helping employees' families over tough spots. Some of this money has been secured by a periodical "whip round" and some by personal contributions by the senior staff and directors.

But apart from money help a lot of valuable and generous assistance in other ways has been given.

Not only is the big firm able to institute ways and means for maintaining the health, contentment and efficiency of employees: the small firm, too, can contribute much help that is invaluable

By G. ORMONDROYD

Works Organizer

For example, in the coal shortage small grants from the company's own stocks were made to employees' families who were specially badly hit. During the winter, also, the firm's solarium (for sun-ray treatment) has been opened for a couple of hours daily to employees' wives and children, especially young children. Treatment is given under supervision of the nurse.

This has been especially valuable in the past winter months and has undoubtedly saved much illness and consequent expense to employees' families. As a director of this concern remarked:—

"Apart from humanitarian considerations it is illogical to do everything possible to keep employees feeling fit and well if their families are not also given extra protection against the risks of illness accentuated by war-time hardships. Even if he himself is well no man can work efficiently if he is worried about the illness of his wife or kiddies. In fact his worry on this score may eventually lead to his own breakdown despite the company's efforts to keep him fit. Our extension of sun-ray treatment and other medical help to employees' families has, we are certain, done much to avoid this."

Most firms have acted generously towards employees injured (either in their homes or at work) by bombs, this is a specific contribution, and a very important one, towards the maintenance of general morale.

This Fund Is Specially For The Bomb-Injured

Here is an example of one firm's arrangement. I quote largely from its own reports:—

"At both our factories funds have been set up to assist workers who suffer air raid injury or damage. The object of the fund is to compensate workers who lose wages on account of absence from work due to personal injury to themselves or members of their families or to damage to their own houses, or to compulsory evacuation owing to unexploded bombs. The amount granted for loss of wages averages ten shillings a day.

"The funds are contributory: i.e. while at the outset it was agreed to consider and meet as far as possible all claims arising from personal injury or damage sustained prior to the date of commencement of the fund, benefits arising from any future damage would be granted only to contributors.

"The funds have been augmented by

personal grants from the directors and from the general welfare funds to which the company automatically contributes.

"The amount of weekly contribution payable varies, having purposely been left somewhat elastic, the minimum being 3d. and the maximum 1s. 6d. At the larger of the two works it has been more or less fixed at 3d. but the fund is considerably increased by means of collecting boxes placed in our lorries which at the present time are conveying members of the staff and workmen to and from the factories."

This Is Another Form Of Distress Fund

Another company has its scheme that operates along similar lines under the title of Air Raid Distress Fund. It is to provide immediate assistance to those employees who suffer personal loss through enemy action and is independent of any government grant to which employees may be entitled.

The directors inaugurated the fund with a gift from the company of £500. The outline is as under:—

1. "Contributions: Threepence per week for men, twopence per week for women.
2. "Only those employees who agree to contribute are entitled to receive any benefit.
3. "Any employees leaving the service of the company or ceasing to make their contributions to the fund are not entitled to any benefits or the return of their contributions.
4. "All claims to be reported to the employment office in the first instance with particulars of assistance required.
5. "The Fund is administered by the Sickness Fund Committee with an additional member representing all office workers. To ensure immediate consideration of all cases of need, a sub-committee of three people is available at all times.
6. "Subscription to the Distress Fund is open to all employees.
7. "Complete a Distress Fund form which is available in your department, authorizing the company to deduct your contributions from your weekly wages. When completed, hand your form to manager."

Entertainments Can Play A Big Part

In another large concern which is in a rather outlying district the sports and

entertainments activities have been greatly developed on the basis of the truth of the old adage "All work and no play . . ." In fact the dances, boxing contests, plays, cinema shows, etc. of this concern have established a reputation for many miles around. Most of the employees live in local neighbourhoods and whereas before the war their families rather criticised the district as dull and without amenities they now find the place an almost constant round of gaiety. Since the war the firm's own workmen have more than doubled the size of its recreation hall which now sees a packed house many nights each month, blackout, raids and other difficulties notwithstanding.

These entertainments have done a very great deal to "keep up the pecker" of six hundred employees and their families.

The Shopping Problem Can Be Considerably Eased

Without elaborate arrangement at all any firm, even the smallest, can do something to relieve the many difficulties of today. The family shopping, for instance, is an almost universal problem. It was at its worst of course back in the depth of the winter. With the lengthening daylight hours it is certainly not so bad, but even so there still remains a lot of difficulty that could be removed. Therefore ask employees to ask their wives if they would prefer to have the week's housekeeping on a Wednesday instead of Friday. Because of early shop-closing hours and food shortages they may much prefer this. If they do, alter pay day accordingly.

In many industrial centres the descent at week-ends of thousands of housewives on retailers already short of many important commodities has resulted in much hardship.

Women employees, too, even those who are not married and have no serious responsibilities, want to do their essential shopping in more convenient times than a final rushed half hour in the evening or week-end. And there is no reason why they shouldn't. A bit of intelligent organization could easily arrange periodical "time off" for this purpose. The trouble is, it goes against tradition to let employees off for a little while in the daytime: the idea shocks most departmental managers—and higher up executives.

Get rid of this silly notion that the

firm is losing something by letting employees off in their "paid for" time. In increased loyalty and goodwill it stands to gain a great deal more than it loses.

And anyway it is the broad objective of maintaining as much contentment as possible among workpeople that is the vital thing to-day. If firms can't shake themselves free of the delusion that working time is sacrosanct then let them look at this broader aspect of the matter.

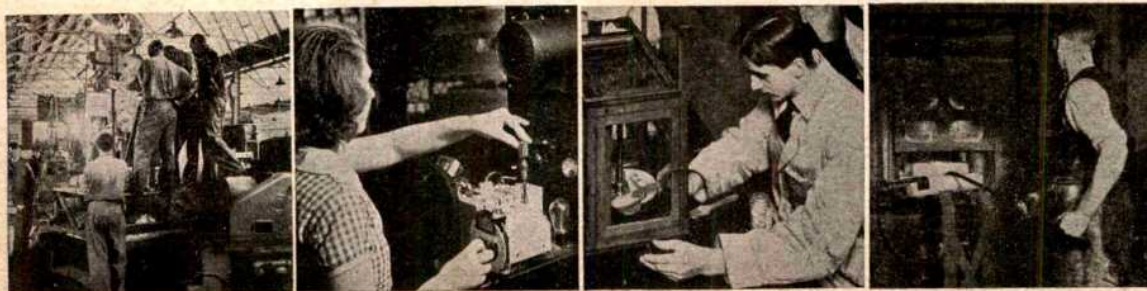
All firms, of course, are not situated in localities which make such a scheme possible: my remarks do not apply to them but to the thousands of others that *could* easily arrange it.

Every Firm Can At Least Do Something

And so pretty well every firm, the very smallest as well as the bigger concerns, can find *some* way in which it can contribute to this immensely important need of keeping up morale. If none of the foregoing ideas seem to offer any scheme that is practicable to you, then, if you merely set out consciously to make every employee as happy, or at least as contented, as possible then you will indeed have done a very valuable work.

Sandbag Throwing Starts Good Anti-Fire Bomb Training

AS a 'game' to aid the proficiency of incendiary bomb fighters the A.R.P. officials of one firm devised a contest of throwing sandbags into white circles painted on the ground. Marksmanship, they report, was stimulated by the spirit of competition which was keen, especially between factory and office staffs. But when a 'heavyweight' in the accounts department broke the factory champion's record of distance and accuracy for "putting the sandbag" still fiercer competition broke out between the rival factions in the matter of carrying first buckets, then tanks of water! Final superiority has not yet been settled but, as one executive put it, "It's d— good training."



TREND OF TRADE

Now Business Must Make Another Big-Scale Adjustment



SHOP sales figures for January are certainly informing. Again, as in December, the cash value of sales was very slightly below (0.3%) that of a year ago. This means a net fall of 26% in the volume. The fall is almost entirely due to the drop of 8.8% in sales of non-food merchandise: food sales actually rose by 5.8%.

In spite of these falls the value of stocks rose by 25%, food stocks by 25.7% and non-food by 20.2%. This reverses the previous downward trend. I regard it, however, as accidental, there having been few, if any, sales in January, stocks have not fallen as they normally do. Conversely, buyers have not held back until February for new season's goods; on the contrary they have seized on whatever they could get. This situation will gradually make its own adjustment.

The sale of piece goods is dropping heavily all over the country. Yet sales are maintained at about last year's volume (—26.4% in cash) despite a cut of 50-70% in supplies. This is particularly due to shops relying on old stock.

Where the trade is not heavily restricted for supplies, as in boots and shoes, the rise is no higher (+ 19.9%) in cash. What we must now expect is a sharp reduction in sales of all women's wear, men's wear, furnishing and fancy goods, towards the level of supplies now available. In other words, the gap between sales running at around 70% of pre-war will have to be reduced to 30-50% of the 1939 figure.

Shake-Up Among The Manufacturers

THE drastic new plan for reducing the number of manufacturers in the industries subject to the Limitations of Supplies Orders is designed to expedite the process to free man power for war production, to keep down prices. The case for the step in the textile industries particularly need not be argued. As a technical journal points out, labour and machinery are being wasted throughout these industries. "There are mills today," says this journal, "carrying up to 150%

overheads in the cardroom to maintain only 50-75% of their spinning capacity."

In some industries manufacturers are only able to work at 30% of capacity owing to limitation of supplies. Interesting point is how best the reduction in operating units may be secured.

Clearly nothing need be done in industries like that of carpet manufacture, where factories are working to capacity because export orders and Government orders take up the slack left by the reduction in supplies allowed for the home market. To interfere with the already highly concentrated working of such factories would merely be to aggravate the situation by the unnecessary transfer of workers and work from one factory to another.

There are many ways in which the rationalization of civil industries can be achieved. In the shipbuilding industry it was done by forming a company, the members of which owned practically the entire industry, each member paying a levy of 1% of the sales price of vessels commenced on his yards after a specified date. Many redundant shipyards were acquired and either cared for and maintained or dismantled and sold. In the cotton industry, the Cotton Corporation actually bought and operated a number of mills while putting others out of action.

In the electrical industry redundant plants have often been put out of competition by the granting of a licence to manufacture for the industry some one or two lines for which the company's plant and skill were particularly suited while being paid compensation for its reduction in output.

Note: "No further official figures of overseas trade will be available. With the disappearance of these figures, the lack of movement in the unemployment figure which makes it valueless, and the general dearth of official returns, the publication of a statistical survey of business conditions in this country becomes almost impossible. Now, and in future months, I shall therefore deal rather with the trend of business than with a discussion of specific figures"

By **CECIL CHISHOLM, M.A., Business Consultant**

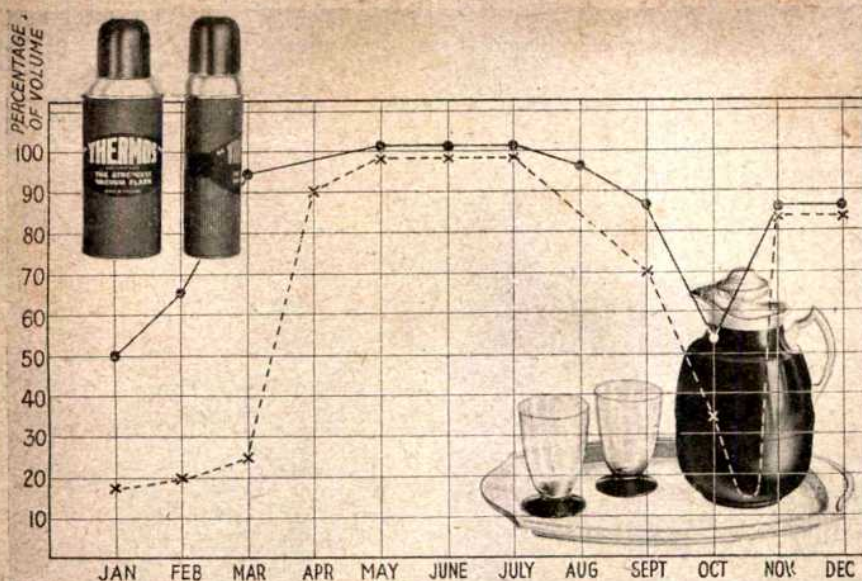
A Tricky Export Problem

IN dealing with this problem the export business of all the firms concerned will have to be carefully conserved, but civil servants must remember that it is often impossible for a small or medium sized concern to manufacture for export, unless it has at least a basis of home business. Any number of nice problems will arise in the smaller industries as to how the strongest member, which may have specialised in the home market, is to handle a multitude of models which some of its competitors have accumulated for their special export lines.

Transport Troubles

THE report of the Institute of Transport on exporters is fairly informing. Unfortunately the smallness of the sample taken (the chief questions apparently answered by fifteen members) makes the value of the conclusions reached dubious.

Three points, however, do emerge. One is the extremely short notice given in regard to cargo closing, the failure to advise as to changes in sailing, the delays in delivery of shipping documents. The second is the continual and costly delays by the railways en route to shipping ports, the refusal by railways to lift freight, and the out-of-date information as to congestion of the port of destination. Finally, many exporters would like a Ministry of Export to fulfill all the export functions of the B. o. T. and D. o. T.



At one time this product was a sharply seasonal one. As shown by the dotted sales curve the selling period was comparatively narrow and suffered from violent rises and falls. A much improved selling policy (solid line curve) broadened the active periods, considerably reduced the contrasts between "on" and "off" seasons and consequently lowered the selling costs. Incidentally, production routine and costs benefited greatly.

By

G. BERNARD THOMPSON,

Vice-Chairman

Incorporated Sales Managers' Association

Selling Costs . . . How They Can Be Controlled

DURING the last 20 years I have been associated with firms marketing nationally advertised products. My illustrations therefore, relate to such products, but the fundamentals can be applied to any business.

There are many angles to the subject of distribution costs, and the point of view of the Sales Manager may differ in some slight degree from that of the director in charge of distribution or the board of directors who have to consider all the other phases of a business.

Direct Cost of Selling: By Territories: Products, Customers.

A Sales Manager must be vitally interested in these facts.

I want to establish the very important point that sales and distribution costs should be treated in such a way as to recover all outlays incurred and at the same time allow for the creation of an adequate profit. I just wonder how many sales managers know what profit their department makes. I am assuming that we are considering the working of a hypothetical company that follows the modern practice of preparing an annual budget of income and expenditure, and would mention that any figures included here by way of illustration are fictitious. Let us analyse the various items which should be included in such budget.

First, we have the sales forecast

This is a Basic article: not limited to war conditions. Selling cannot altogether stop because of war, and anyway the *Planning of Sales Control* for the future must go on. Meanwhile many new people are understudying for positions with, or as, sales managers.

They will find this article helpful: comprehensive yet practical and quite devoid of frills

showing gross sales less credits, breakages and spoilages, giving our estimated net sales. Under the heading of expenditure, the following items have to be estimated:

Production of Goods;
Warehousing, Packing and Despatch;
Sales Expense;
Advertising Expense;
Office Expense;
General Expense;
Standing Charges—Rent, Rates, Insurance, etc.;
Contingencies;
Reserve for Income Tax, N.D.C. and E.P.T.

Deducting the total expenditure from total net sales shows the profit we are aiming to attain, and it is usual to break down the expenditure items to a percentage basis. Let us assume, therefore, that our company's estimated annual net sales are £200,000 and that

the selling costs should not exceed 3 per cent., or £6,000 per annum.

Estimating The Sales Promotion Expense Items

My interpretation of the items that come within this category is:

1. Sales Manager's Salary.
2. Sales Manager's Expenses.
3. Sales Manager's Commission.
4. Salesmen's Salaries.
5. Salesmen's Commission.
6. Salesmen's Travelling Expenses.
7. Salesmen's Bonuses.
8. Contingencies.

It is a debatable point whether sales promotion expenses should come under selling costs or advertising expense. Perhaps it would be well if I define what items I consider should come under advertising expense:

1. Advertising Manager's Salary:
2. Advertising Dept. Salaries:
3. Space in Newspapers:
4. Space in Magazines:
5. Radio:
6. Posters:

7. Car & Van Sides: 8. Railway: 9. Display Material: 10. Display Space: 11. Display Installation: 12. Samples (Trade): 13. Samples (Public): 14. Trade Mailings: 15. Trade Paper Advtg.: 16. Circulars, Booklets: 17. Exhibition: 18. Films: 19. Trade Contests: 20. Demonstrations: 21. Novelties, Premiums: 22. Co-operative Advtg.: 23. Miscellaneous.

From these items it will be seen that sales promotion expenses have been allocated to advertising expense.

Investigating The Sources Of Sales

In this investigation I would mention that our hypothetical company is distributing its products through wholesalers, multiples, chain stores and retailers, and that our rates of discount are:

Retailers—25 per cent. from the retail selling prices;

Wholesalers—12½ per cent. from price to retailers;

Multiples—10 per cent. from price to retailers;

Chain Stores, 10 per cent. from price to retailers.

Further, we have quantity discounts for retailers:

Orders of £20—25 per cent. and 10 per cent.;

Orders of £10—25 per cent. and 7½ per cent.;

Orders of £5—25 per cent. and 5 per cent.;

and we pay carriage on orders of £5 and over.

It is essential, therefore, that we should analyse all invoices to determine what percentage of our sales comes from the above sources. A hypothetical allocation might be:

Wholesalers	£100,000 = 50%
Multiples	20,000 = 10%
Chain Stores	20,000 = 10%
Retailers	60,000 = 30%
	£200,000 = 100%

Sales to wholesalers, multiples and chain stores are usually "house account," for which the sales manager is responsible; consequently the selling costs we have to control are the sales to retailers, who are contacted by our travellers.

Determining The Sales Costs of The Travellers

The number of travellers to be employed depends on the number of outlets. As I have been associated with the chemist's trade for a number of years I am assuming our products are sold to chemists, of whom there are about 12,000 retailers in addition to 2,000 multiple branches. We are therefore concerned with the travellers' sales to the 12,000 retail chemists.

When compiling our annual budget we provided that our sales costs should not exceed 3% of the total estimated net sales of £200,000, or £6,000 per annum. This, therefore, is the figure we have to keep within.

Let us estimate our expenses under this heading as:

1. Sales Manager's Salary ...	£800
2. Sales Manager's Expenses ...	£200
3. Sales Manager's Commission (a)	
4. Salesmen's Salaries	£1,800
5. Salesmen's Commission	£1,500
6. Salesmen's Travelling Expenses	£1,200
7. Salesmen's Bonuses (b)	
8. Contingencies	£500
	£6,000

(a) Payable out of contingencies only on excess sales over budget estimate.

(b) Payable out of contingencies only on excess sales over travellers' quota.

We have estimated our sales to retailers at £60,000, of which sum £50,000 is obtained by the travellers by personal sales, the balance of £10,000 coming direct, on which sum travellers receive a lower commission, which, I believe, is customary in certain trades. And we have estimated that our travellers cost us for salary, commission and expenses £4,500, which, on a total turnover from their area of £60,000, gives a percentage of 7½% for the travellers' selling costs, and this is the figure we have to keep within.

Fixing Travellers' Quotas

Having thus determined our limits the next step is to institute a control system to enable this to be done. First, a quota should be fixed for each traveller, based on his figures for the previous year, plus a percentage increase if this is considered desirable. You will recall that it is on excess sales over quota that the travellers' bonus is paid, and consequently they have the inducement to go all out to beat their quota figures. Every month, each traveller's salary, commission and expenses should be ascertained with a cumulative total for each succeeding month, such figures being compared with the budget estimate each month

and each quarter, also cumulatively for these periods, with comparison with the corresponding periods of the previous year.

Let us then fix hypothetical quotas for six travellers to cover the £50,000 personal turnover in the budget, bearing in mind the figures for the previous year. It must be remembered that each traveller's area is different in many respects. One or two may be wholly industrial, another mainly agricultural, and the remainder a mixture of industrial, agricultural and residential.

Here then is an apportionment:

Traveller	Personal Turnover
A.	£10,000
B.	10,000
C.	8,000
D.	8,000
E.	8,000
F.	6,000
	£50,000

Now what other information do we want to enable us to assess each traveller's work and make a comparison with each other? First, each traveller's selling cost to his personal turnover should be ascertained. We fixed 7½% as the selling cost figure for all the travellers. It may be that one or two will be below this figure, while others will be above it, but collectively the percentage should not exceed 7½%. Travellers' areas differ in many ways, some may be compact, others scattered, consequently some allowance must be made in making a comparison.

The Cost Per Call

This is reflected in the next figure we require, that is, the number of calls he makes per day. I regard this information as very important as it can prove several things. For each traveller the number of calls per day should be consistent, although one traveller may make more calls than another by reason of the difference in their areas.

A periodical analysis should be made to ascertain what is the actual average selling time spent with a customer, that is, from the time the traveller enters the shop to the time he leaves, also the time spent waiting outside when another traveller is in the shop, as it is an unwritten law not to enter till he has left, and further, the time spent travelling from one call to another.

A Sales Manager friend of mine selling to the grocery trade tells me that his figures are:

Working Hours

9—1 and 2—6 = 480 minutes.

The number of calls per day is 15.

Selling time spent with customer—
Per Call

Average 15 mins. = 225 mins.

Waiting time—

5 mins. = 75 mins.

Travelling time—

12 mins. = 180 mins.

480 mins.



(Continued overleaf)

The cost per call is to be found by dividing the amount of the travellers' selling expenses each month by the number of calls made, as ascertained from their daily reports. There should be a similarity in the cost per call of travellers working an area where the potentialities for business can be regarded as equal, as where one traveller works north of the Thames and another south of the Thames, or in areas which are wholly industrial or wholly agricultural. Due allowance must be made, of course, for the selling ability of each traveller.

Getting At The Cost Per £ of Business

Another interesting figure is to ascertain what every £'s worth of business sent in by each traveller costs. This is found by dividing the traveller's personal sales into his selling cost.

A record should also be kept of the number of orders sent in by each traveller. By dividing this figure into the traveller's personal sales, one ascertains the average value of each order.

Comparing the figures for each traveller usually reveals some interesting facts. One traveller might average £15 per order, while another £5 per order, from which one might deduce that the £15 man specialises on the bigger buyers, while the £5 man may not be such a good salesman, and specialises in obtaining a greater number of orders of smaller value.

Our next item is the percentage of orders to calls, and is ascertained by dividing the number of calls into the number of orders. For instance if 300 calls are made and 100 orders booked, the percentage of orders to calls is 33.3%. In other words, one order booked in every three calls.

I must put in a word of caution here. The traveller's mission is to obtain the highest possible sales and not to make the highest number of calls; but to obtain sales he *must* make calls, therefore it is possible for the traveller who makes the fewer calls to have the greater sales, and, conversely, the one who makes the highest number of calls to have the lowest sales. The percentage of orders to calls, therefore, to some extent, reflects on a traveller's selling ability.

VALUE of Average Sale : An Important Figure

There is a close relation between our next item, the average value of order per call, and the previous item—the percentage of orders to calls. The average value of order per call is found by dividing the traveller's personal turnover by the number of his calls. Let us take as our illustrations, personal turnover £900, number of calls 300, average value of order per call £3; and in the case of another traveller, personal turnover £1,500, number of calls 240, average value of order per

call £6 5s. It is reasonable to assume that the latter traveller pays particular attention to the bigger buyer and goes all out for a good-size order.

It has been said, rightly or wrongly, that most travellers take the line of least resistance and sell those lines which are the easiest to sell either on account of the demand for them or because they are seasonal lines. This is a point which every sales manager should watch, and one way of overcoming the difficulty is to fix a quota for each individual article.

Many manufacturers insist that the travellers shall sell the lines which show them the greater margin of profit, which is a very wise policy.

Do you know what is the profit and loss limit of your orders? If not, you should analyse the travellers' sales by products, for some of them may be concentrating on certain lines to the detriment of others, and perhaps the lines on which there is a preponderance show the lowest margin of profit, or even a loss.

Summary of Items to Show Trend of Sales

An analysis should be made of all the items I have dealt with, and these should be summarised as follows:

1. Each month with comparison with the corresponding month of the previous year.
2. Cumulatively with comparison with the corresponding period of the previous year, i.e., the figures for the first and second month should be

totalled and so on for each successive month.

3. A separate statement should also be similarly prepared showing the traveller's sales against quota which in effect is against budget, as I explained earlier on.

The above information shows the sales trend by areas as compared with the previous year, and throws the spotlight on each traveller's activities.

I have thus shown how selling costs are controlled in respect of travellers' sales, travellers' areas and products, and the statistics that have been compiled should give every sales manager valuable information which can be used to considerable advantage. Statistics serve no useful purpose unless they are carefully studied and comparisons made in regard to each traveller and each area. Properly analysed and controlled, they enable the sales manager to evaluate every product and the various territories, thus assisting his travellers to function to the fullest possible extent.

Travellers require direction, as without such direction and control there is the risk of sales decreasing instead of increasing, and unprofitable lines being sold in excess to the detriment of the profitable lines. Travellers should always aim at increasing the size of their customers' orders—for that is one of the surest ways of reducing distribution costs and creating profitable sales.

The foregoing was originally delivered as an Address to the Nottingham branch of the Incorporated Sales Managers' Associations.

War-Time Advertising Has Cured Us of a Fault

Having to design simpler, harder-hitting appeals for smaller spaces has convinced us that our copy and matter in pre-war big spaces was overdone and far too complicated. We shall correct this in our post-war publicity.

By The ADVERTISEMENT MANAGER
Of a Firm Marketing Toilet Products

IN scaling our advertisements down to smaller war-time sizes we have certainly learnt this valuable lesson. Our large pre-war spaces, especially the full pages in magazines, had become far too "full up," we put too much into them.

We didn't realise it of course. Our publicity seemed to compare well with anything else of its kind. But then it is probable that other people's had developed more or less the same fault.

That is the tendency over a long period of build-up.

Our own advertisements, like many firms', were the result of development. Every bit of copy, every picture and diagram constituted what we thought to be a vital point. And in course of time many indeed were these "vital points" that had been created and added. Into our big spaces, in fact, we had tried to get *everything*.

When we had to draw up quarter

pages and six-inch doubles instead of full pages and eight or ten-inch triples our copy and layout men were panic stricken—almost. And it was at this point that we came to realise we had been overburdening our big spaces because, to make good advertisements of the little spaces we saw it was not a matter of just leaving out bits of the larger advertisements. It was something quite different from that. We should have to take fewer points, or even single ones, and create a fresh presentation that was altogether more simple, more direct and with much greater "stopping power."

Now that we've had a few months' work on these smaller spaces we believe we have developed this simplicity, hard-hitting angle into a very effective technique.

In fact so pleased have we been with

the appearance and appeal of these revised layouts that, as an experiment, we had several enlarged (by photostat) up to the bigger sizes. These enlargements looked exceedingly well. We have had several conferences on them and have obtained opinions about them not only from senior executives, but also from our salesmen in the field and even from the families of our factory employees (the product being one of household interest), and the voting has been almost wholly in favour.

The times are not ripe of course for our going back to big spaces, but I think we have been forced by circumstances to learn a valuable lesson.

"Simplicate and add more lightness" seems to be a good slogan not only for product designers and production men to follow but also for advertising men to try.

Big-space publicity will not come back for a while yet so in the meantime I heartily recommend a little exercise in preparing your post-war full pages and ten-inch triples by writing copy and layout for *good* adverts. of half or even quarter the size and then simply "blowing them up" to the required scale.

This gives the simplicity and directness of the small size advert. in the dignity and prominence of a big space, a quite different thing from taking a big space and then putting in enough matter to fill it.

This idea may not meet every need for matter with which to grace *all* the big spaces you will use in post-war business. But try it out now as an experiment. You may learn something, as we did.

As Further Assistance to our Married Workers We Provide These Family Allowances

By A. WYNN,

Jt. Managing Director, Midland Electric Manufacturing Co. Ltd.

SOME time ago we instituted a system of Supplementary Grants to all employees to offset the rising cost of living. Now we have augmented this with a scheme of Family Allowances.

This company, realising that the extra cost of living falls more heavily on a married man with a family than on a single man, worked out a plan which provides additional weekly payments for each dependent child. The scale is generous—a married man with three children will receive 6/- per week additional to the present supplementary grants.

The scheme, which it is hoped to operate at least for the duration of the war, applies to all works employees and to members of the staff below a certain salary level.

The new arrangement is an extension of our policy of full consideration for the older and more mature type of worker and it is hoped that it will still further bind the very happy relations which have always existed between the management and its employees.

As A Guide To Executives In Other Firms

For other executives who may be interested in starting a scheme of their own the following are the simple rules governing our arrangement:—

1. The scale of the weekly Allowances is for the first child ... 3/-

The increasing cost of living naturally falls heaviest on the married employee with a family; but it is the services of this type of mature, experienced worker that we particularly want to retain. One aspect of our scheme therefore has this object in view.



for the second child ... 2/-

for the third child and subsequent children ... 1/- per child

2. The Allowances are paid only for children who are under 14 years of age (or under 16 years of age if still at school) and who are dependent on and wholly maintained by the applicant for the Allowances.
3. The Allowances are paid only while the applicant remains in the service of the company.
4. The Allowances are not considered in the calculation of the applicant's bonus or overtime payment.
5. In the event of the applicant's absence from work for any reason, payment of the Allowances is not made if the absence exceeds a total of three days in the week (counting Saturday as a whole day).
6. All employees on check number are

allowed to participate in the scheme but for staff employees it is limited to those whose total remuneration is less than £300 per annum.

7. Where payment of the Allowances is being made, any change in family circumstances (for example, the birth or death of a child or a child's leaving school) must be notified immediately to the Personnel Department.
8. Each applicant for the Allowances is required to complete an application form and to supply any additional information necessary to substantiate his claim for payment.
9. Pay dockets for the Allowances are issued each week and are obtainable from the applicant's foreman or chargehand.
10. Allowances are normally paid out.

Continued on page 32

DATE		ORDER		WORKS ORDER		FINISHED		WORKS ORDER NO.											
RECEIVED FROM				DELIVERY INSTRUCTIONS				PROVIDED											
DESCRIPTION OF ORDER				A B															
MATERIAL		VALUE		OPERATIONS		OPERATIVE & NO.		TIME		COST		O/T		COST		MATERIAL		COST	
C																			
D																			
TOTAL																			
DELIVERY ADVICES		WORKS ORDER NO.		PROCESS		MONTH		DATE		DELIVERY DUE		TOTAL LABOUR COST							
D X U		1 2 3 4 5 6 7 8 9 10 11 12		1 2 3 4 5 6 7 8 9 10 11 12		1 2 3 4 5 6 7 8 9 10 11 12		1 2 3 4 5 6 7 8 9 10 11 12		1 2 3 4 5 6 7 8 9 10 11 12		1 2 3 4 5 6 7 8 9 10 11 12		1 2 3 4 5 6 7 8 9 10 11 12		1 2 3 4 5 6 7 8 9 10 11 12		1 2 3 4 5 6 7 8 9 10 11 12	

This is the Works Order Record and takes the form of a Visible Index Card with Flimsy. The Flimsy is printed exactly the same as the card and is perforated approximately according to the heavier broken line which indicates the four sections. The Flimsy is separated at the perforations, Section C being sent to the Stores as a total Bill of Quantities, Sections A, B and D going to the Departmental Foreman to enable him to allocate the operations over his men and machines.

Big-Firm Efficiency CAN Be Put Into the Small Business

THE old saw about great oaks developing out of little acorns is, like most aphorisms, a half-truth only. The originator would have contributed a more accurate observation if he had added the important qualification "provided seed, plant and sapling receive proper sun, air and soil nutriment."

Apply this simple analogy to business and you are bound to agree that unless the small-to-average business receives "sun, air and soil nutriment" in the form of progressive thought and the adoption of modern, efficient methods, there is little hope of it ever emerging from the small stage, in fact if it survives at all it will be a stunted thing not to be admired.

Naturally, no principal or director of a small-to-average firm wants his concern to remain in that category. To allow this would be to admit a predetermined apathy which does not exist. Yet how many businesses suffer from the very effects which could be brought about by that cause.

False Confidence Is A Great Business Enemy

The cause of stunted growth is hardly ever sheer apathy. It is usually misplaced confidence—false confidence in the capacity of one's memory, ability and energy.

Many firms are retarded in their

development by these falsities on the part of principals and I have often written of the need for such concerns to adopt a progressive outlook and adopt those measures of economic effectiveness which would give them the much needed "sun, air, and soil nutriment."

When I am confronted by the much-used excuse that the small-to-average business cannot afford to adopt efficiency I have always emphasised the fallacy of this contention and have retorted that, on the contrary, the reverse is the case and such a concern cannot afford to do *without* efficiency

"Efficiency" does not imply "costliness"; it implies "simplicity." Simplicity in a method means that it can be put in at low cost; simplicity of operation means that no expensive labour is required to work it. That is why the small firm can have big-firm effectiveness

By JOHN ARTHUR

Business Organizer and Consultant

measures. Efficiency does not necessarily mean expense—even if we allow that such expense is investment. No, efficiency means—or should mean—simplicity.

I have from time to time given examples of how small businesses can—if they will—adopt the very latest proved methods, not at a *cost* but at a *saving*, because old-fashioned methods are not only costly in their results but in their operation.

This month I return to the subject because I have come across a really good example of how a firm employing about 200 workpeople on the manufac-

7 4 2 1				7 4 2 1				7 4 2 1				7 4 2 1				7 4 2 1			
THOUS				HUNDS				TENS				UNITS				THOUS			
WORKS ORDER NO.																			
DATE																			
WORKMAN																			
DEPT. OF TOL. NO.																			
MATERIAL																			
NO. PRODUCED																			
NO. PASSED																			
TIME TAKEN																			
CLOCK ON																			
ORDY. HRS. MINS.																			
O/TIME																			
TOTAL																			
RATE P/W RATE																			

This is the Operation or Job Card, an appropriate series of which are made out in respect of each job when the Works Office have dissected the order into operations.

One of these Operation Tickets is handed to each workman who takes part in the work.

ture of light engineering products found themselves in a hole through mistaken ideas of memory, ability and energy and decided to get down, to a good system automatically to control:

1. The manufacture for stock of small parts for sub-assemblies.
2. Manufacturing to order which may or may not involve stock as above.
3. All non-productive work such as cleaning, repairs and maintenance, waiting time, etc.

There is no point in occupying valuable space on inquests as to causes of ineffectiveness so in order to give as clear a picture of procedure as possible I propose to describe what happens from the moment an order is received.

This Is How The System Operates

When a customer's order is received the details are entered on a visible works order record. This is in four sections and has a flimsy copy which will be described later.

From the illustration of the card, which has the four sections lettered A, B, C, D, the recording procedure can be easily followed.

At the top of the card (Section A), the date, works order number (this is also the job number), who the order was received from, the delivery destination and routing, and the due date and rate of delivery, are entered.

Provision is also made for entering the "finished" date at top. These entries at the top serve for easy reference when the card is subsequently filed, the purpose of such reference being to utilize the experience as to costs, time, materials, etc., in connection with estimating for future similar jobs.

Section B is next entered with a full description of the order and the card and flimsy are passed to the works manager who—from this full descrip-

tion—enters a bill of quantities in the "Materials" section, and the operations and their sequence in the column headed "Operations."

Having completed the visible works order card so far as possible, the works clerks next make out a series of operation and material tickets of the hand-punched variety on the basis of one labour and one materials ticket for each operation (in some cases an operation requires no material from stores, therefore tickets are not required) and these tickets are pre-punched for works order number, operation number or stores number and department number.

This completes the works office routine to this stage and the flimsy section C is sent to stores as a bill of quantities

for the job. The items named thereon are checked for stock and then entered on the stock allocation sheet on the visible stores ledger.

Non-possession of stock items produces from the stores a "Material Delay" advice note and the job is held pending receipt of stock either by purchase order or works (stock) order.

Assuming the possession of all the materials items, the flimsy, Sections A, B, and D, are sent—together with the appropriate punched material and operation tickets—to the foreman who decides the operator and the machine (these are constants, by the way).

The foreman files these order details cards, etc., in delivery due date order and on a job going on to schedule he hands to the operator a labour ticket and, where applying a materials ticket. The labour ticket is punched for operator's number before being handed out and the stores number is punched on the stores ticket so that when the operation is completed and the tickets are duly in the hands of the stores and foreman respectively, they are ready full pre-punched for costing and other purposes.

The materials pre-punched ticket is, of course, handed in by the workman in exchange for the goods he receives. He is clocked on and off the labour pre-punched ticket, and the return of the ticket indicates the progress of the job and is in fact used by the works office to check progress in relation to promise before being passed on to costs, who price and extend it and summarize it and its fellows into groups to check up to wage analysis figures on the pay-roll in gross, and man's master clock card individually.

Regarding progress, should the return of labour tickets suggest delay on the job, this is at once investigated and if necessary an amended finish date

7 4 2 1				7 4 2 1				7 4 2 1				7 4 2 1				7 4 2 1			
THOUS				HUNDS				TENS				UNITS				THOUS			
WORKS ORDER NO.																			
DATE																			
ISSUED TO																			
CHECK NO.																			
W. NO.																			
QUANTY																			
DESCRIPTION																			
BIN NO.																			
VALUE																			
PART USED FOR																			
FOREMAN																			
TOTAL																			

This is the Stores Ticket and takes the form of a Unit Requisition, the units or separate requisitions totalling to the Bill of Quantities for the job, as assessed by the Works Office and as indicated on the Works Order Record and Flimsy. Where appropriate, one of these Tickets is handed to the operator together with the job Ticket as illustrated above.

entered on the line "Delivery Advices." At the same time a letter confirms a 'phone call to the customer to this effect.

The Works Order Record proper is kept in the works office in cabinets and is duly entered up from the labour tickets and other media until there is a

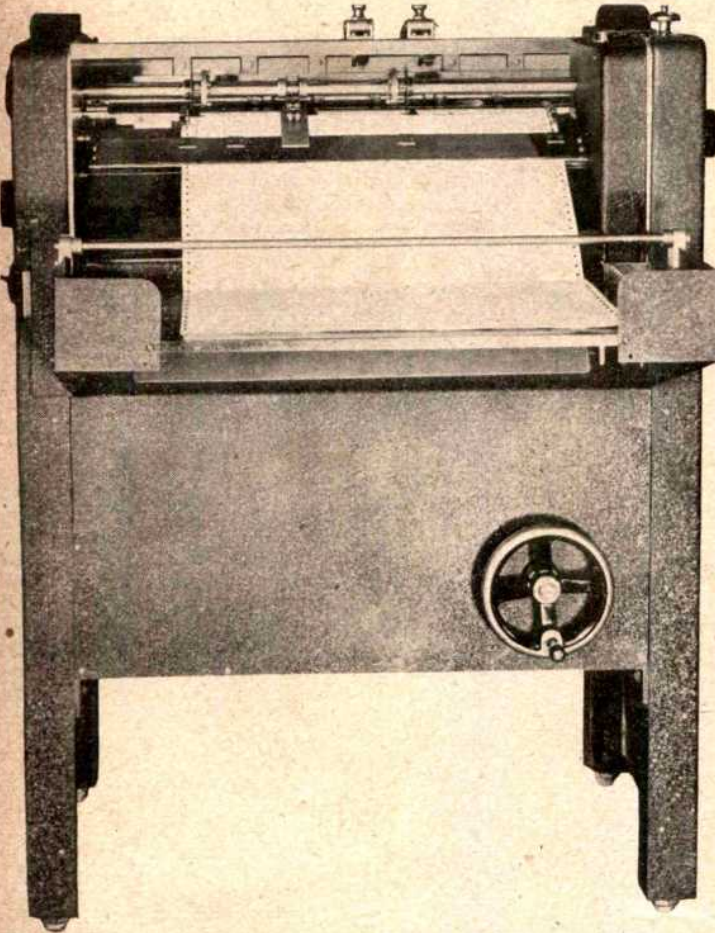
complete record of the placing, manufacturing, progressing, and costing of the order.

The visible edge of the Order Record provides for control "at a glance" and after completion, the record is filed as previously mentioned, as a guide to future similar orders.

Illustrations of some of the records are given and the remainder will be shown in another article when I will give a more detailed description of the motivation, operation, and influence of the various documents used, together with a chart depicting the *modus operandi*.

A Slow Hand-job Vastly Speeded-up . . .

by this New Machine that Cuts, Trims and Arranges Sprocket Punched Stationery



This machine not only trims off punched margins and cuts forms to length but also arranges sheets in order and, if necessary, prints them with serial numbers, date or other information. Illustration shows front view of machine

SINCE the introduction of sprocket punched stationery it has been adapted to pretty well every type of cylindrical and flat-bed platen office machine. The absolute accuracy of registration which the system ensures is such an outstanding advantage in particular kinds of work that its use is becoming universal practice in progressive offices.

It is still customary to remove the vertical and horizontal perforations by trimming and cutting the paper in pack form on a printer's guillotine and then separating the forms by hand. In some cases the punched margins are removed by tearing by hand along the perforated lines.

In other cases no attempt is made to remove the punched margins and the forms are torn by hand and separated.

These methods have not been found very satisfactory, however, because of the obvious slowness of the operations and because, with the guillotine, the

pack is left with every other sheet reversed and a lengthy hand operation is necessary to re-arrange the sheets in correct position.

An improved method of trimming and separating forms is now provided by a new Cutting and Trimming Machine which has been specially designed and produced for the purpose of trimming off the perforations, separating and arranging the individual forms in their correct position and, if required, printing the date, serial number, or similar information on each form.

The method of operation is as follows: The pack of paper is placed on the feed platform and the leading edge inserted between the guides. The machine then—

1. Feeds the paper automatically by means of pin-wheels which engage in the sprocket punching,
2. Prints on each form the date or

serial number or similar information,

3. Trims off the punched margins,
4. Cuts off each form to exact length,
5. Stacks the finished sheets in order at a speed of 3,000 forms per hour.

The machine is simple and compact in design and its general arrangement can be seen from the accompanying illustrations.

The side cutting is performed by circular disc cutters which are adjustable for width, whilst the cross-cutting of the paper is effected by a special chain driven reciprocating circular cutter which, operating from below the paper, give absolute safety in operation.

The machine is adapted for dealing with a wide range of stationery sizes. Forms can be cut to lengths ranging from 3 inches to 9 inches in steps of one-sixteenth of an inch and in widths varying between $5\frac{1}{4}$ inches and $17\frac{1}{4}$ inches.

The trimming cutters for the edges are adjustable independently of the pin wheels so that any width of margin above half an inch can be removed. This margin cannot be less than a quarter of an inch from the centre of the sprocket holes.

The machine can print the date in two places on each form at the top of the sheet or the same device can be adapted to print a serial number or other symbol. The cost of such serially numbering or dating of forms can therefore be saved.

From these brief details it will be appreciated that this cutting and trimming machine can render valuable aid to all users of sprocket punched stationery quite irrespective of the type of machine on which this stationery may be employed.



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(See page 23 of "BUSINESS" for January for full description.)

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DEPARTMENTS

EXT. No.

BOMB DETECTION - - - -	12
EMERGENCY DRINKING WATER PLANT	16
INDUSTRIAL ELECTRIFICATION -	18
COMMERCIAL ELECTRIFICATION -	19



This engineering assembly shop provides a good example of well planned general lighting. Note the even distribution of a reasonably high intensity of illumination and how this is assisted by the relatively light ceiling

By

C. J. MISSELBROOK, B.Sc.(Eng.)

Factory Lighting in War-time

WAR, with the consequence of intensified working, especially for long hours in the blackout, has increased both the need for good lighting and the difficulties of obtaining it.

That good lighting is of even greater importance under war conditions can be easily shown—

Suppose, in peace time, a factory operative works at full efficiency under natural lighting, but that his work is only 60 per cent. efficient under inadequate artificial lighting. This drop in efficiency reacts on his employer's balance sheet as a loss of but 6 per cent. because the hours worked under artificial light are only some 10 per cent. of the total working time.

But today, when the factory may be working in artificial light for the whole twenty-four hours this efficiency drop now represents a 40 per cent. loss to the nation's war effort: a state of affairs that must not be permitted.

The importance which the Government are attaching to this matter of factory lighting clearly indicates that they appreciate the vital part which lighting plays in the production of every kind of manufactured goods.

By improving the lighting installation, the worker's efficiency during black-out hours is increased with beneficial results to the factory's total output.

War conditions have resulted in the introduction of unskilled or semi-skilled workers, and it will be appreciated that the work of training such people will be greatly facilitated if they are not expected to strain their eyes on unfamiliar tasks due to inefficient lighting. In addition, the calling up of young men and their replacement by older workers increases the need for good lighting, for the eyes of older people are not as efficient as those of the younger generation and consequently need more light for the equivalent "seeing conditions."

The Fifth Report of the Departmental Committee on Lighting in Factories issued in June 1940 has given a number of important recommendations and has indicated a minimum standard of illumination which, although it would have been regarded a few years ago as lavish, is in accordance with all good modern lighting

***WHY** lighting affects output so much more directly in present conditions*

***WHAT** comprises proper lighting for specific kinds of work*

***HOW** it can be put in and maintained at top efficiency*

practice.

The Committee's recommendations may be considered under two headings, *vis*: Adequacy and Suitability, each of which presents its own problems that have to be solved before any efficient lighting scheme can be evolved.

On the subject of adequacy the report recommends a minimum illumination of "6 foot candles without prejudice to any additional illumination required by the nature of the work." This intensity applies to parts of the factory where persons are regularly employed, and is a drastic increase on the 1 foot-candle which was considered satisfactory when the last report was published less than two years previously, but the intensity recommended is easily obtainable with modern high efficiency light sources.

*uncomfortable working conditions unless good ventilation is provided. This is, of course, primarily a matter for the ventilation engineer, but if the problem is acute the lighting specialist can often reduce the amount of heat generated by using an alternative type of lamp. For example, the "Sieray" Fluorescent Tube is a good alternative to the 200 w. gas-filled lamp, giving about the same amount of light but operating at a much lower temperature. This will serve as one instance of the means by which the heat from electric lamps can be reduced, but it should be understood that it is really a problem of ventilation.

How To Overcome Difficulties Of Blackout Requirements

The Lighting Expert Can Help

Solve Ventilation Problems

The question of providing sufficient illumination may raise one difficulty, that of heat. It may not be realised that quite an amount of heat energy is generated by electric lighting, and this may give rise to

In the same way the problem of the blacking out of factory premises should not hinder the provision of adequate illumination in the interior. In the early days of the war many light sources were screened with improvised shields constructed of brown paper. Unfortunately in many cases these temporary arrangements have been allowed to become permanent,

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In this work-room the general lighting is so effective and so well placed that even for fine, accurate detail work no auxilliary local lighting is required at any of the work-tables

causing patches of high illumination under the lamps and very dark areas in between. This is a very unsatisfactory and dangerous state of affairs, and is in opposition both to the Fifth Report and to all modern lighting practice. In these cases the blacking out of the windows should be done efficiently so that no light is visible from outside whatever the intensity of illumination in the factory interior.

These Light Locks Are Essential

At Some Points

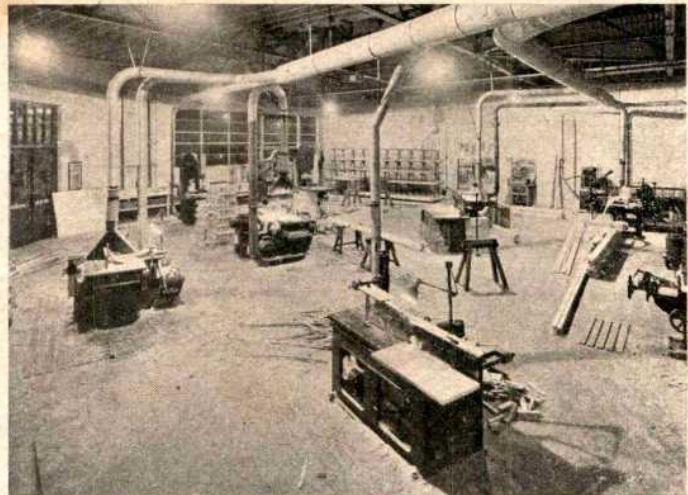
Light locks may be used advantageously in many situations in factories. It has been found quite frequently that light passing through ventilators may infringe black-out regulations. Light traps have been designed to overcome this difficulty, and types of traps for various standard ventilators are illustrated and described in the British Standard Specification B.S.1 A.R.P. 31. From the study of the principles employed in these instances it is a simple matter to design efficient light traps for non-standard ventilators.

Doors which open directly from a well-lighted interior into the gloom of the black-out are very dangerous from two points of view. Firstly, whenever the door is opened, black-out regulations are of necessity infringed, and secondly, the eyes of the person leaving the factory do not have time to get accustomed to the darkness and for several moments such a person is to all intents and purposes blind. Under these conditions serious accidents may occur.

Light locks can be easily constructed to meet these conditions. The essential point about such locks is that all direct light must be shielded from the exit, the light which finally emerges having been subjec-

ted to at least two reflections from matt black surfaces. In order to give employees leaving the building time to get accustomed to the dimness of the light outside, it is advisable that the lighting of passages leading to the exit doors should be of as low an intensity as is consistent with safety. In addition, this lighting may well be graded so that it falls off in intensity

Here is a case where the general lighting need not be of such a high order as that shown above; but notice how high-efficiency lighting is provided at each machine by means of a widely adjustable local light-unit



as the exit door is approached.

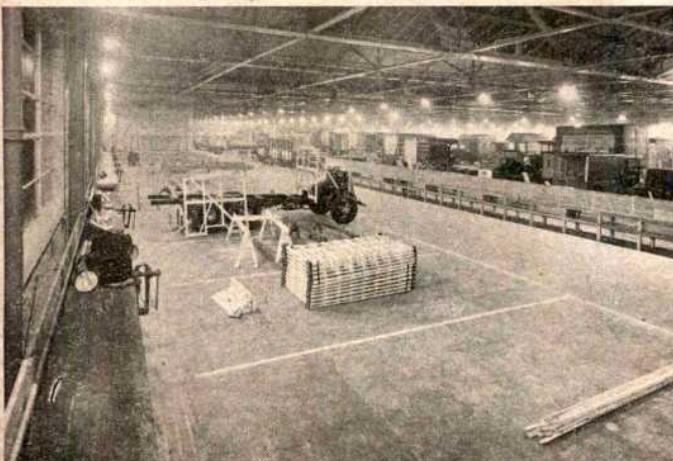
Difficulties have also arisen with the lighting of loading bays where it is essential that work should continue during black-out hours. Here again a simple form of light lock can be formed with heavy opaque material. The back of the lorry being loaded can then be lighted to an adequate intensity whilst the bay is blacked out by means of the body of the lorry and the material mentioned above.

similarly no one concerned with the maintenance and installation of lighting should be without a lightmeter. These are readily available and direct readings of the light intensity in any part of a works can be made without practice or experience. Lightmeters are usually direct reading for tungsten lighting only, and factors are available for use when dealing with electric discharge lighting. Readings taken at specific points, at intervals of perhaps a week, will readily indicate when reflectors are in need of cleaning, or lamps in need of changing. It is safe to say that no installation can be maintained in a satisfactory condition unless a lightmeter is readily available to the engineer in charge for the purposes indicated above.

It seems to have been assumed that black material must of necessity be used for black-out purposes, but such is not the case. As long as the material used does not transmit light its interior surface may be of a light colour which will, of course, lead to better conditions in the works concerned.

GLARE, Producer of Eye-Strain And Bad Work

The subject of glare is given prominence in the official recommendations. It is not a difficult matter to solve the problem of



In this body-building and repair shop use is made of angle reflectors on walls in order to increase the amount of light on vertical surfaces

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So cotton service dress and overalls issued to men in the Forces are made of cloth that is commercially shrunk to a specified standard. This standard of resistance to shrinkage is a very high one. It corresponds closely to what has long been associated with "Rigmel"-Shrunk in civilian cloths.

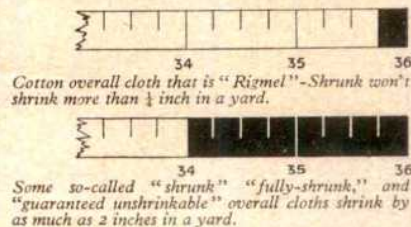
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direct glare as any reflector which complies with B.S.S. 232 is suitable. These reflectors are designed to give a cut-off from lamp glare at 70° from the vertical, and if used with the lamps for which they are designed the brightness of the reflecting surface is below the maximum allowable brightness of 10 candles per square inch. We have stressed the importance of employing lamps of the size for which the reflectors are designed as we have come across many instances where glare has been caused by using lamps of a higher rating.

Whilst lamps of too high a wattage will give rise to excessive glare, those of a lower rating will impair the efficiency of a fitting by altering its light distribution. The above can be summed up by saying that a fitting is most efficient when used with the lamp for which it is designed.

Even correctly designed reflectors can give rise to direct glare if they are not mounted sufficiently high, and for this reason a table of minimum mounting heights has been suggested. These range from 8 ft. above floor level for 60 watt lamps, to 24 ft. above floor level for 1,500 watt lamps, and cover electric discharge in addition to filament lamps.

In certain instances the structural design of the building may make it uneconomic or impossible to mount the fittings at or above the minimum mounting heights which the report suggests. Under these circumstances frosted visors may be used in conjunction with general lighting reflectors to reduce the brightness of the fitting to below 10 candles/square inch.

There is yet a third method of reducing glare and this is by using lamps of the fluorescent type which have a low surface brightness of large area. In this connection the Sieray Fluorescent Lamps are eminently suitable as their surface brightness is below the 10 candles per square inch mentioned above. The lamps can be viewed directly without the least impression of glare, and no disconcerting after-image remains as happens when one looks directly at a tungsten filament or ordinary electric discharge lamp.

How Local Lighting Takes Care Of Special Needs

There are many instances where the type and standard of work requires a higher intensity of illumination than can normally be provided by general lighting, and in these cases it is usual to provide the minimum permissible illumination of 6 foot candles by means of the general lighting and to supplement this by local lighting. Care must be taken, however, that the contrast between the illumination of the work and the general illumination of the surrounding field of vision is not too great, as otherwise the eyes of the operative will be constantly subjected to strain. It is recommended, therefore, that the ratio of the intensities of local lighting to general lighting should never exceed 10:1. Thus, if for a specific task 100 foot candles is needed, the general lighting should not be less than 10 foot candles.

All local lighting points should be fitted with opaque shades, as a bare or inadequately screened lamp is a very potent source of glare. Such a light will inevitably lead to eye-strain and often to serious accidents. Care should also be taken in the positioning of the reflectors so that the local lighting on one machine does not subject some other operative to serious glare.

Shadows are, of course, always potential sources of danger, but a well designed

installation should not give rise to shadows. In some instances, however, where there is a large amount of overhead belting and shafting, shadows may sometimes occur, and in these circumstances it is necessary to pay extra attention to the correct siting of the lighting points and often to include additional fittings especially to obviate shadows.

Sometimes It Is Necessary To Light

Up the Ceiling

It has often been found helpful from a psychological aspect to provide a certain amount of illumination on the ceiling in order to relieve the "tunnel effect," which is otherwise obtained. There are, on the market, several excellent types of fittings which are designed to achieve this object and in the opinion of operators who have had experience of both systems of lighting, the light which is used to illuminate the ceiling is well employed.

Good Lighting Is Just As Important

In Offices

Whilst the report is chiefly concerned with lighting in factories it would obviously be inconsistent to allow poorly lighted offices to remain in conjunction with a well-lighted factory. The I.E.S. code gives recommendations for office lighting which range from 6-15 foot candles and these values should be maintained. Drawing offices are of almost as great an importance as the factories themselves, and the great accuracy needed leads to a demand for high intensities of illumination. The figures recommended cover the range of from 25-50 foot candles.

The Government Departments concerned, recently decided that the importance of adequately lighted factories in the country's war effort was such as to justify immediate attention being given to the problem. A central body of the electrical industry was established to deal with the matter, and it was decided that those factories which were working mainly on Government contracts should be dealt with first. Each of these "key" factories, therefore, received a letter from the appropriate Ministry requesting them to have their lighting checked by a competent engineer and, if necessary, to bring it into compliance with the standards laid down by the Illuminating Engineering Society. The services of a lighting engineer were made available to every factory through the central body which is known as the National Industrial Electric



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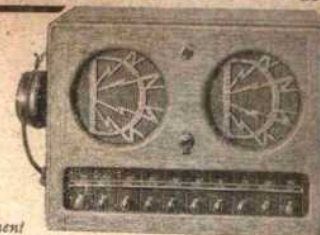
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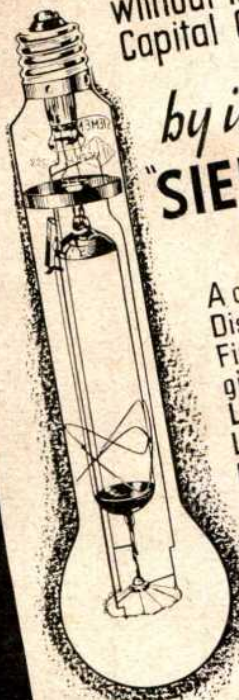
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Lighting Service.

The decision as to whether they should apply to the central body was left to the factory executives themselves and they had three alternative courses open to them. Firstly, if there was a person in their employ who was competent to deal with the matter they could leave it in his hands to advise them what action was necessary. Alternatively, they could obtain the services of an illuminating engineer through their usual suppliers of lighting material or, as a third alternative, they could request the central committee to arrange for a competent lighting engineer to survey their lighting. All those sent by the National Industrial Electric Lighting Service to advise on factory lighting under this scheme have had considerable experience in factory lighting, and can be relied upon to give impartial advice which is based on a wide knowledge of lighting problems.

Facilities For Better Lighting Open

To All Factories

In addition to the foregoing scheme which applies to "controlled" factories, a general scheme for all factories with more than a specified number of employees and working more than 48 hours per week has been inaugurated under the auspices of the Ministry of Labour and National Service, following on the Fifth Report which recommends a minimum intensity of 6 foot candles. These factories can also apply to the National Industrial Electric Lighting Service for the services of a competent lighting engineer.

The fact that the country is at war has led to one difficulty in the carrying out of the above schemes, namely, the possible shortage of raw materials for the manufacture of reflectors, conduit and other components necessary for an efficient lighting scheme. It has, therefore, been urged on all lighting engineers who are engaged on this work that they should bear this fact in mind when advising factory executives, and that every possible use should be made of existing material whether in the form of reflectors or wiring; this is in many instances very difficult.

With reflectors the matter resolves itself into two distinct problems (a) of a factory in which many different sizes of reflectors are used and (b) of a factory lighted mainly with one size of lamp. In the first instance, reflectors which have to be scrapped from one section of the factory may be usefully employed in some better other part. In the second instance, this is not possible and the decision will have to be made as to whether it will be better to replace all the existing reflectors with those suitable for higher wattage lamps, or to increase the number of reflectors so as to utilize the existing equipment. It is impossible to lay down any hard and fast rules for such cases and each should be treated on its own merits.

With regard to wiring, it may often be that the existing cables, transformers, etc., are incapable of carrying any greater load and yet the installation is below standard. In these circumstances the use of electric discharge lamps is often of great value, as by employing them the lighting intensity may be increased without any increase in the lighting load. Here again, the decision will have to be made as to whether it is more economical to employ discharge lamps with their higher initial cost or to rewire the building. Once more each

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case must be treated entirely on its own merits.

These Improved Lamps Need No Special Fittings

Sieray-Dual lamps have often proved of immense value in such cases as those mentioned above. The lamps can be readily interchanged with tungsten filament lamps with no alteration to the existing wiring as they are designed to operate without choke or condenser. As the light output of Sieray-Dual lamps is from 30 per cent. to 50 per cent. greater than that of similarly rated tungsten filament lamps, it can readily be understood that they are invaluable where more light is imperative and current consumption cannot be increased.

The importance which the Government are attaching to the question of factory lighting at the present moment indicates that they appreciate the vital part which lighting plays in a modern factory, and that they are determined it shall play its part in the country's victory. We hope that this demand for improved lighting will not be merely a wartime measure but that it will be continued in the days of peace which we all hope are not far distant.

By its close interest in the matter the Government has recognized the vital part played by lighting in the war-time production power of the nation. It is hoped that, when the war is over, industry will still further utilize the science of lighting as one of the most effective instruments of economic management.

Urgent: Save More Waste Paper

MANUFACTURERS in the fibre board and cardboard industries appeal to all executives who read the magazine to *save more 'waste' paper.*

"Waste paper," they urgently announce, "is now practically the only raw material available to manufacturers of fibreboard, cardboard, etc., and on these materials in-turn depends almost the whole of the packing of the country's industrial output. Supplies of imported timber have been reduced to a fraction and are required for vital purposes. The imports of foreign fibreboard, cardboard, etc., have nearly ceased.

"A vast quantity of board is being used in connection with munitions, either directly, or for packing them. In addition to this, the whole of the distribution of very many essential goods involves some form of packing, and to produce the board for this purpose, waste paper is required.

"Owing to the restriction in the consumption of paper, there is less available, and the quantities obtained from trade sources by waste paper merchants have fallen off very sadly. This means that not a scrap of what *does* remain should be wasted, and every factory, office, warehouse and shop throughout the country should, in the interests of industry as a whole, co-operate in this

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**When the Power
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can free you!**

A recent controversy suggests that there are two types with an "Old School Tie" complex—those entitled to wear "The Tie" and who believe it can help them on in life, and those *not* entitled to wear it, and who believe that that must keep them back. **BOTH ARE WRONG!**

For the road to success—in whatever sphere you choose, whether business, social life, factory work, or the Services—lies indisputably with your ability to **SPEAK**: not just to *say* words or what is in your mind, but the power to put your thoughts into that forceful or persuasive speech which alone can help you to advance along the lines that *you* will. You may be able to wear the "Old School Tie" and yet find this one of the subjects your high education didn't touch; you may not have had the advantage of a University education and still win your way through to the really Big Things of Life!

**EFFECTIVE SPEECH
is the KEY to SUCCESS
IN EVERY CAREER!**

For the chances are that you yourself have the power of effective speech in *you*, just as much as those orators and leaders in all walks of life who have secured their positions through that supreme confidence engendered by their knowledge of how to use their words to best advantage, and how to play on the emotions of their listeners.

Learn about the New and Easy Method

Those who are progressing today, those who **will** progress, men and women alike—in business or profession, in the Services or the workshops—are those who have the initiative to free themselves from timidity, self-consciousness, embarrassment, "stage-fright." Everywhere, in every walk of life, you find the forceful speakers among the leaders, among those who direct and control. A free book, entitled "How to Work Wonders With Words," explains how to acquire quickly the ability to develop poise; personality, and how to banish timidity, self-consciousness, "stage-fright" and lack of confidence; how to put your case convincingly, and how to address business

conferences, meetings, lodges, clubs, etc. 70,000 men and women in all walks of life—including business executives, salesmen, clerks—have found in this remarkable book a key that has opened a veritable floodgate of natural speaking ability. It has revealed to them an easy way to advancement in position and salary, personal power, prestige, and real success. Thousands have accomplished such unusual things through this simple, easy yet effective method. You, too, can develop this power of speech—easily, quickly, surely. Send for the book at once. Don't let an "Old School Tie" complex hold you back a day longer. Your copy is waiting for you. No cost—no obligation. Simply post the coupon NOW.

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matter. Will you please strengthen your efforts before the position becomes even more difficult?

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You Should Know About These Books

Keeping Up to Date with War Legislation

SINCE the war began there has been an enormous output by Parliament and Departments of State Acts, Rules and Regulations which affect every person and business.

The difficulty of keeping up with these introductions is immense, in fact impossible for the average business man.

To meet this problem in the simplest and most economical way a plan of subscription to a system of loose-leaf war legislation has been devised.

The 1939 and 1940 legislation is ready in two separate volumes at 30/- and 35/- each respectively, while periodic loose-leaf parts are issued at 5/- per part, post free.

The publications set out the full text of the Acts and Orders—with full notes on their meaning, cross-references, linking up relevant subjects and a complete index.

The publishers are Hamish Hamilton (Law Books) Ltd., 90 Gt. Russell Street, London, W.C.1.

Your Fire Watching Obligations

OCCUPIERS of business premises are bound to make arrangements for fire watching: workers in business premises are bound to take turns of duty at their places of employment. But these seemingly simple orders involve all manner of complications and apparent difficulties both for employer and employee.

A neat booklet, written by a barrister-at-law explains the exact nature of your obligations, in clear non-legal language. The title is *Fire Watching*, the author John Burke, and the price is sixpence plus 2½d. postage, from Hamish Hamilton Ltd., 90 Gt. Russell Street, London, W.C.1.

What's the Purchase Tax On It?

CALCULATIONS by mental arithmetic, pencil and paper, slide-rule and so on have had to be increased

enormously since the purchase tax had to be worked out.

To lighten this burden a special purchase tax ready reckoner has just been published. In very many firms the majority of transactions are between fairly narrow price ranges, this ready reckoner therefore has been issued, not in the usual book form, but as fifteen loose sheets so that users can mount the sheets most used on cards for easier handling. The sheets are of substantial paper, matt surface on the backs to take adhesive and varnished on the fronts to ensure hard wear.

The sheets provide for a tax of 33½% and 16½% net, also for cash discounts of 1½%, 2½%, 3½%, 5%, 6½% and 7½%. The title of this publication in the *Purchase Tax Calculator*, by E. J. Simmonds; the price is 1s. 6d. from Geo. Routledge & Sons Ltd., Broadway House, 68-74, Carter Lane, London, E.C.4.

Family Allowance Plan

Continued from page 19

- at the Personnel Department each week on Thursday evening.
11. The Company hope to continue the scheme for the duration of the war but reserve the right to discontinue or amend the scheme without notice. They also reserve the right to decide to whom the Allowances shall be paid and to refuse payment where, in their opinion, this action is justified.

12. Application Forms are obtainable from the Personnel Department.

In common with many progressive executives we feel that methods such as this go as far as possible to assist valuable employees to carry the burden of increasing economic pressure while at the same time avoiding the worst dangers of inflation.

We believe that the greatest asset of any manufacturing concern is its force of *trained personnel*. To keep that force as intact as possible and operating at top efficiency should be every management's most important aim—especially now. But this cannot be achieved unless, between management and personnel, there is a bond of sincere mutual goodwill. In our company we do feel that this exists.

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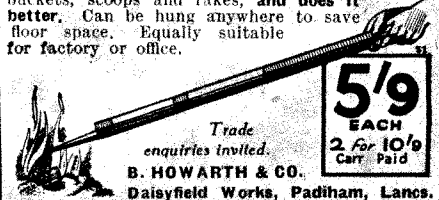
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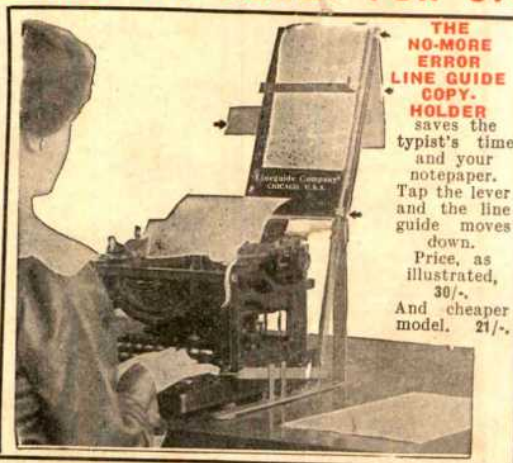
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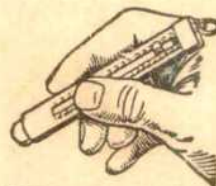


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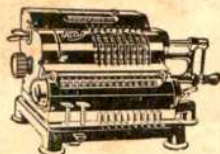
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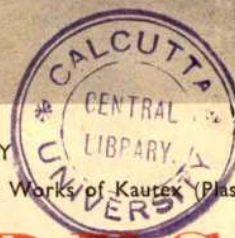
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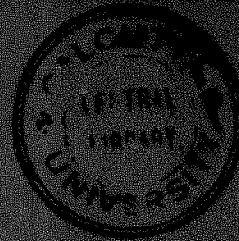
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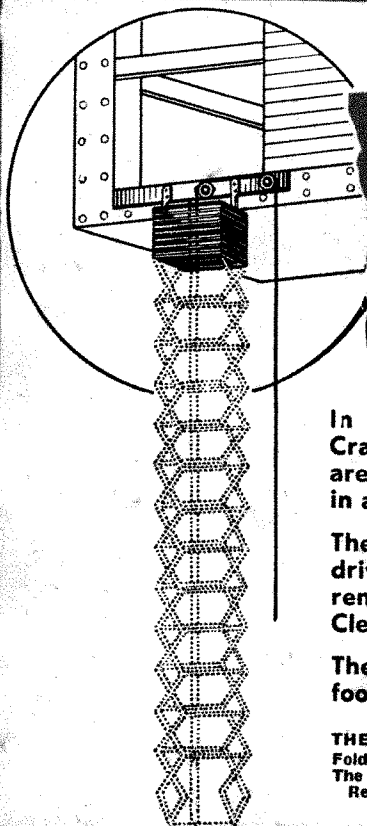
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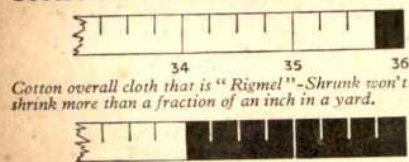
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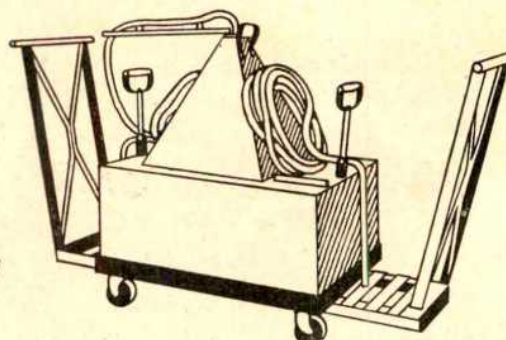
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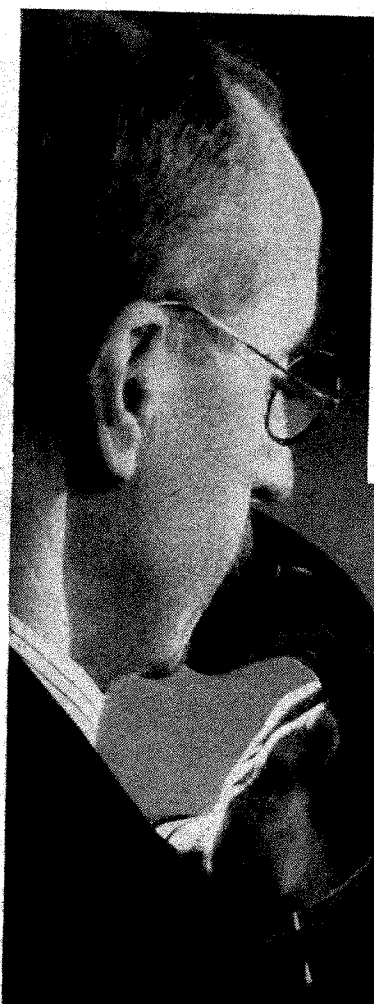
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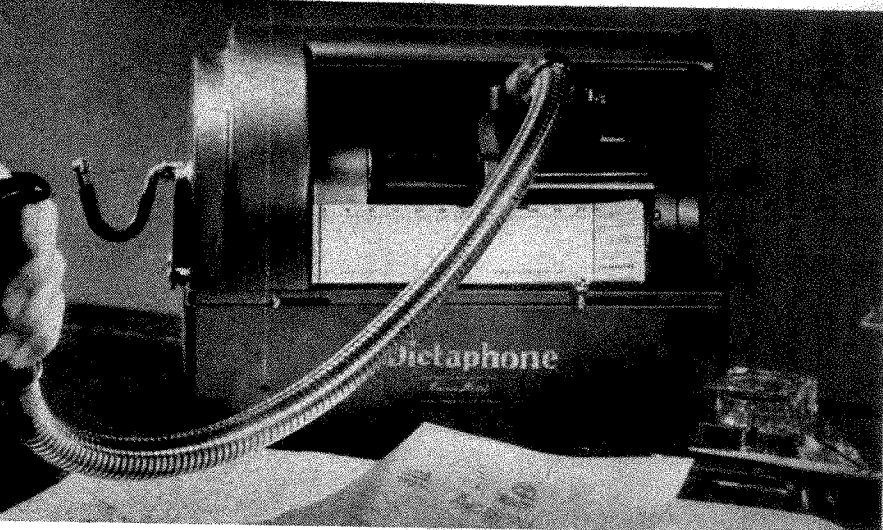


The Government are taking powers to compel **everybody** to bear his share in the Empire's battle. At any moment **your** staff may be drastically reduced by the "call up." How will you carry on? Carry on you must if the war is to be won.

There is only one way. Every individual on the staff you are allowed to retain, **yourself included**, must **do more work**. Naturally you are all working hard as it is. But you **can** do more with the aid of the dictating machine.

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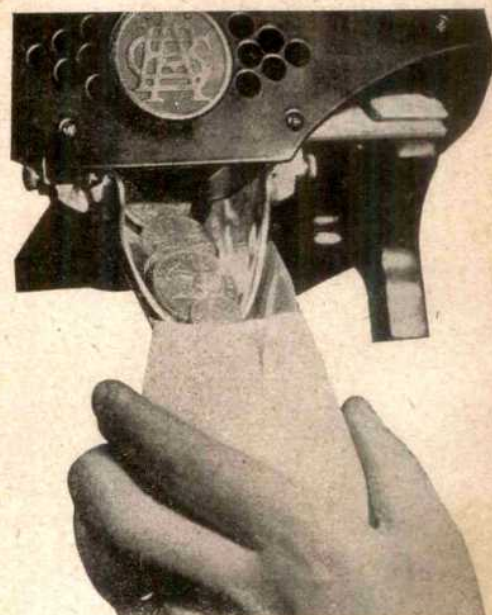
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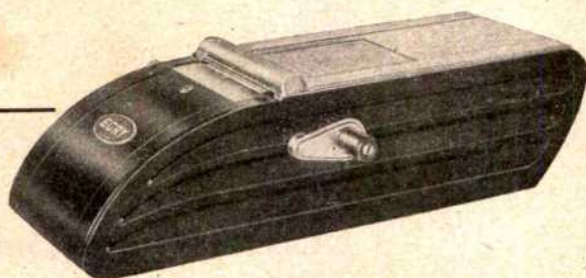


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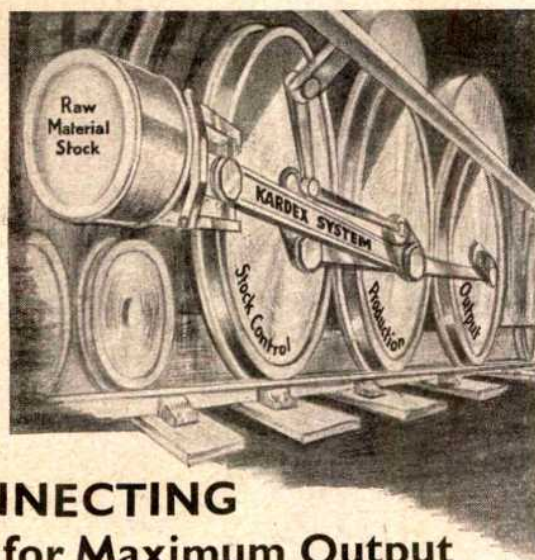
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A 4 POINT PLAN TO INCREASE WAR PRODUCTION

A MESSAGE TO MANAGEMENT.

In a recent broadcast speech, Mr. Ernest Bevin, Minister of Labour and National Service, showed how urgent was the need for more workers — especially women — in Great Britain's War Industries. Employers who are playing *their part* in the drive for greater and still greater war production will find this 4-point plan a sure guide.

HERE ARE THE FOUR VITAL POINTS LAID DOWN BY THE MINISTRY OF LABOUR.

- 1 Skilled men are needed for the really skilled jobs. Be sure that each of your men is employed up to the very limit of his skill. Combat skilled labour shortage by breaking down processes wherever you can, and by training up your workpeople, men and women, to jobs of greater skill.
- 2 Training Schemes must be developed to the greatest possible extent. Take in more new workers for training on the job in your own works. Remember that the Government will help you with semi-skilled men and women trained under official schemes.
- 3 Prepare, now, to employ more and more women. Look constantly to women for your new recruits: they are excellently suited to many types of semi-skilled work. Hundreds of thousands must enter war production this year and every factory must play its part.
- 4 Efficient personnel management is essential. Remember that you must secure the whole-hearted co-operation of your workpeople. Look closely to their welfare. Many of them may be new to industry: be patient and help them all you can during the first difficult weeks. A little foresight will reduce your labour turnover.

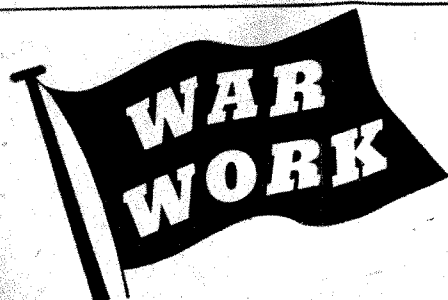
THE MINISTRY OF LABOUR AND NATIONAL SERVICE HAS DISTRIBUTED A GUIDE TO THE EMPLOYMENT AND WELFARE OF WOMEN WORKERS. EVERY RESPONSIBLE EXECUTIVE—WHETHER HE BE EMPLOYER OR MANAGER—MUST INSIST ON SEEING IT.

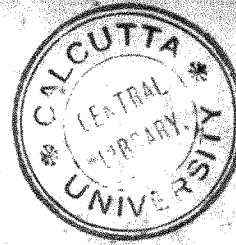
You should make a special point of reading the new booklet "THE EMPLOYMENT OF WOMEN. . . SUGGESTIONS TO EMPLOYERS." Problems created by the increasing influx of new women workers into war factories are dealt with clearly . . . concisely; and the suggestions contained in the booklet will be of interest and great value to YOU! If you have not yet received your copy, instruct your secretary to write for one TO-DAY, to the local Employment Exchange, asking for pamphlet P.L. 87/1941.

These are the contents in the Booklet:

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| 1 Appointment of a Woman Personnel Officer. | 4 Interviewing of candidates. |
| 2 Functions of a Woman Personnel Officer. | 5 On engagement. |
| 3 Consultations preparatory to the introduction of Women. | 6 On reporting for duty. |
| | 7 During first month of employment. |
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First Progress Report on **CONCENTRATION** Of Industry

1. Progress Report

SOME business men are still recovering from the shock of concentration. For those upon whom the axe will fall, there can be nothing but sympathy. But it is absurd to suggest that the scheme is premature or unnecessary. Actually it is twelve months overdue.

In the industries concerned sometimes 70%—80% of the firms are working at anything from 25%—80% of capacity. The consequent rise in overhead charges is out of all reason, the waste in man power criminal.

In some of the industries neither on war work nor in the export trade, such as cosmetics and electrical plating, there is no other means of saving four-fifths of the concerns from a lingering death.

The need is only less urgent in industries like the jewellery trade where export business is taking up some of the slack. It may prove illusory in industries working both for the Ministries and for export, such as the shoe industry.

Yet that industry is also due to fall under the Concentration axe in due course. So will others affected by the controls of the Ministry of Supply, such as the Timber Control and the Paper Control. Personally I doubt whether much will be possible in the shoe industry. There are few shoe factories not working full time to-day.

Every Factory to Work to Capacity— May Mean Double Shift

While there may be exceptions like this, generally speaking every industry concerned will be concentrated until the factories still in use are operated to capacity. And "capacity" may mean a double shift.

From the practical point of view it is useless to kick against the pricks. For the Ministry of Supply controls most materials and the Ministry of Labour completely controls labour, so that a firm determined to stay out of the scheme at all costs would presumably find itself without either materials or workmen in the long run.

The scheme is moving ahead faster than many people realise. Although no certificates have yet been issued, dozens of arrangement* schemes for concentration are already before the officials concerned.

One third of these schemes come from the hosiery trade, with the leather trade second and cosmetics a good third. Obviously, action has been most rapid in the industries hardest hit by the Limitation of Supplies Orders and the Purchase Tax.

• Whether your industry be non-essential or essential, you are vitally affected by the Government's revolutionary scheme for saving man and machine power.

• Here is the first detailed account of its progress, of the obstacles it is meeting, of methods being adopted to get quicker action.

• Half-a-dozen urgent questions are answered authoratively and finally.

• Mr. Chisholm shows the changes in production practice which may be found necessary to work the scheme where private patents are important.

By Cecil Chisholm

So far the cotton industry has moved farthest on the path to concentration. For here the Cotton Board acts as a ready-made B.O.T. Commission on the spot. In one week of March, 80 spinning mills were closed down, and hundreds of others will follow suit.

The preliminary meetings for explanations of the scheme from the B.O.T. officials, for association action, etc., have taken place in the cotton, carpet, combs, corsets, cutlery, floor covering (other than carpets), blown glass, gloves, hosiery, jewellery and plate, leather, lace and embroidery, plastics, perfumery and cosmetics, photography, piano, pottery, sports goods and fountain pen industries.

2. How the Scheme Works

The urgent necessity for Government action no sensible man denies. What can business do?

What we must do is to see that concentration is applied as efficiently as possible in our own industry.

This is one reason for the surprising

rapidity and relative smoothness with which the concentration of industry is taking place. Firms in these industries can now be divided into:—

(a) Nucleus firms.

(b) Firms hoping to qualify as nucleus concerns by absorbing one or two smaller houses.

(c) The firms absorbed.

It is the latter who have so much to fear and relatively so little to gain. However, when the only ultimate alternative will be to close down...

Perhaps the pottery trade has kicked hardest against the whole scheme, although there have been rebels in the jewellery and cosmetic industries. The complaint of the smaller pottery firms is a double one. On the one hand they contend that concentration will drive the whole industry into the hands of some thirteen large firms. On the other, they point out that these large firms represent only a part of the pottery industry, little or none of the fine hand thrown and specialised work being done by its smaller members. These

objections have force. They can probably only be resolved by extremely skilful handling of the situation, including a careful analysis of the types of work done by the industry, by the Board of Trade officials and the Industrial and Export Council.

Normal concentration schemes are entirely voluntary. The Trade Association acts as a clearing house for the necessary series of private negotiations. It deals largely with the Industrial and Export Council. Even this negative work of the Trade Associations involves difficulty with the individualists. For any independent firm not a member of its Trade Association can make its own arrangements and take them direct to the Board of Trade whose officials will deal with them specially.

Some of the pottery firms complain (I think with justice), that large concerns not in the Association are making separate plans behind their backs. Personally I think that the latitude given to the individualist firms was a mistake. It is impossible to handle a scheme affecting every section of an industry except through a central organisation. Even the individualist comes into line in a blitz and helps his competitor out. Why not now? In peace time they can return to the profitable lonely furrow.

In this case the rebels multiply the work of overtaxed Government officials. Worse, they throw grit into the wheels of the Trade Associations trying to do a good job—and for no valid reason.

I have never yet known an independent in our own industry that did not take every possible advantage of its Association's work, cutely aware that it was making no contribution of money, energy or time towards the common causes of industry. One hopes that the Board of

Trade will deal drastically with some of the selfish old individualists whose feet are so resolutely planted in the Victorian era.

There are a number of ways in which the concentration is being worked out. In the cosmetics industry Tokalon offer two alternative methods of co-operation. They are prepared to trade with manufacturers on a quota purchase arrangement for the duration of the war, but subject to six months' notice on either side.

Or they will manufacture and distribute on a royalty basis.

Tokalon are prepared to disclose their actual cost of production to those considering such a contract. They undertake further that directorate or executive costs will not be increased to the detriment of the cost of production for contracts made.

They will give no priority to production of their own brands, as against those of the firms for whom they are working.

This seems to be a reasonable scheme with a fair chance of acceptance by the smaller concerns.

Captain Lyttleton asks the nucleus firm to "manufacture at cost" for the firms temporarily absorbed. How is this done? Not to allow a small profit margin "a turn," will be to shoulder a loss on the job, as every junior knows.

The pages of the Leicester newspapers contained two or three offers "to manufacture for others" in every edition when I was up there the other day. It is true that the smaller concerns have not been very eager to accept such offers. But on the whole, progress has probably been more rapid than in other industries. There is a reason for this. Some sections of the hosiery trade are working as low as 40% of normal production, while few of them are reaching anything like 70% of normal. There is, therefore, every incen-

tive to get together and keep a certain number of firms running.

I expect the hosiery industry to complete its concentration first, probably within a couple of months; the pottery industry to follow, with cosmetics a good third and cutlery the fourth at the post.

3. Six Burning Questions Answered

1. Maintenance charges are for private agreement.

Gradually some of the most important questions are being cleared up. There was no clear statement, for instance, as to who would be responsible for maintaining the closed-down factory and plant in condition. Now I am told that *this is a matter entirely for agreement between the parties.*

2. Absorbed firm keeps a (reduced) Sales Force.

It is also clear that the absorbed firm is allowed to keep its own sales force. In fact, it becomes a sales organisation instead of a complete manufacturing and selling outfit.

3. Absorbed premises may be let to Government.

Further, where machine tools are not required by the Government and can be removed to other quarters, they will be able in many cases to rent their premises to the Ministry of Food. Captain Lyttleton has indicated that Ministry requires a large number of warehouses up and down the country for the storage of supplies.

Such a firm will therefore have three incomes: one from its sales work in disposing of its own products, a second from rent and a third from the nucleus firm to whom it has sold its production rights.

While this should be consoling to many small concerns, I am afraid that the difficulties rather outweigh the advantages.

4. How to maintain your Brand Name.

The first problem of the absorbed concern is how to keep its brand names alive. Obviously the Board of Trade has no very clear ideas on this subject. Captain Lyttleton has reassured us that "we shall give all the help we can to keeping alive these trade marks." But how?

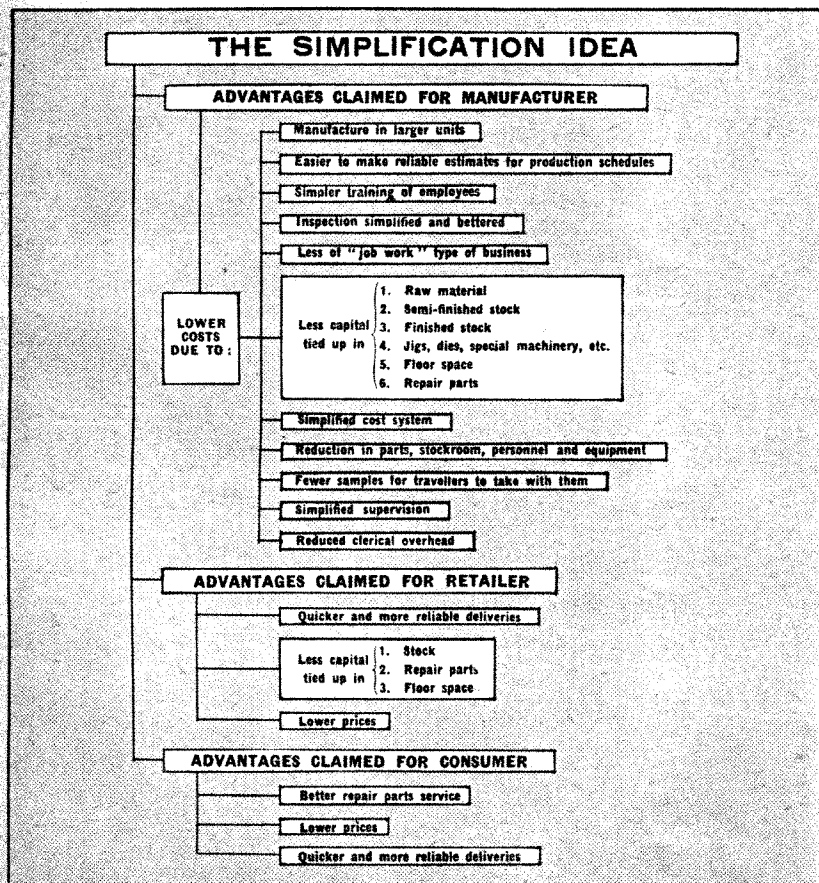
It has been suggested that after the war the Board of Trade will prevent the intrusion of new comers into the field where industry has been concentrated in a few hands. This would be helpful. But again, how is it going to be done?

How prevent an active soap manufacturer from preparing a new face powder from some of the ingredients of his soap or perfumes? How prevent a young genius like Allen Lane from producing an entirely new publishing idea like the "Penguins," however adverse its affect on small book publishers, houses struggling into life again. (I am assuming that the publishing trade had been concentrated which it is not).

Again, how are small firms going to struggle to their feet against the competition of the big fellows who have been making for them, if the latter choose to advertise lavishly and to cut prices?

One answer is that given by an advertising man. "Let the small concern dip into its reserves, if necessary, to keep the brand name alive in the public mind." The remedy is heroic—but will the patient survive it for long?

What any absorbed firm can do is to use a part of its profits for goodwill adver-



Every Man, Woman and Machine Must be Used to the Full

We have now reached a point where all the ingredients of production, labour, raw materials, plant, are precious.

We clearly cannot permit these precious things to be used in a haphazard way. We must secure that the fullest use is made of them. Just as it is one of the satisfactions of the works manager or the industrialist in a heavy industry to feel that the whole of his plant is, as we say, in balance, that his costing system shows the minimum "lost time" amongst the workers, that the whole of the main production is flowing regularly to the delivery end of the plant, that all the by-products are recovered and sold; so we must have the satisfaction of managing the country's war production in just such a way, and of knowing that not one man or one woman or one ton of raw material or one machine is not being used to the full . . .

CAPTAIN OLIVER LYTTLETON,

President of the Board of Trade

tising of its brand. To my mind it will be well advised to keep its reserves for the more urgent business of getting going again after the war.

5. Who pays Income Tax?

A further nice problem is the payment of income tax? Obviously the larger nucleus firm will be paying income tax at 10/- in the £ on its entire earnings possibly plus excess Profits Tax while the smaller concern will probably be outside Excess Profits Tax at least. Under a scheme such as that outlined by Tokalon the question would not arise as the nucleus firm would then be merely a contractor to the others.

6. How to protect a Patent Process?

It is now admitted officially that no manufacturer can be expected to give up to a competitor his pet patent process. Incidentally would the nucleus firm always have the necessary machinery?

Then why should the nucleus firm be allowed to continue its patent under such circumstances? The answer is the production by the nucleus firm of one war-time standard line not embodying either patent process, and sold for the benefit of both firms under a new brand name.

Two results flowing from this situation are widely overlooked. One is the necessity it imposes for simplified practice in production. The other is the need for concentrating distribution.

4. What Simplified Practice Can Do

Concentration is aimed at saving manpower and reducing overheads cost. But

this could be done within the individual industry, in the factories and offices of the individual firms concentrated. Indeed, unless some form of simplified practice is rapidly and effectively applied to these industries the maximum benefit can not be gained from the present concentrated output in the fewer factories. Simplified practice had its origin in America in the last war, but the man who pioneered the idea gained it from studying the work of Mr. Lloyd George of the Ministry of Munitions and of Lord Rhondda of the Ministry of Food in the last war.

As a result of his observations, Mr. Shaw went to Washington in the days just preceding America's entry into the war, in order to put before the authorities his ideas for co-ordinating the entire national effort; for securing priority for war needs in every direction and for generally reducing waste tissues from American industry and life. His ideas were accepted (after a struggle).

The work was ultimately put into the hands of the Conservation Division of the War Industries Board. Here is the plan they worked out for the majority of American industries (among others):—

1. To secure a maximum reduction in the number of styles and varieties, sizes, colours, or finishes of the products of the industry. In this way economy in manufacturing was secured. The number of operations was reduced, and by making larger runs less labour was required. Manufacturers were enabled to simplify and reduce their stocks of raw materials, and the amount of capital tied up in the stocks of finished products in the hands

of manufacturers, wholesalers, and retailers was lessened.

2. To eliminate the styles and varieties that took more than the strictly necessary amount of material.

3. To eliminate features or accessories which used material for adornment or convenience, but which were not actually essential to the serviceability or utility of the product.

4. To eliminate patterns and types of products that were less essential to the civilian population.

5. To substitute materials which were plentiful for those that were scarce and difficult to produce.

6. To reduce the excessive waste of materials in manufacturing processes.

7. To secure economy in the use of samples for selling purposes.

The savings made were remarkable.

They affected every type of life. By putting the amount of thread on the spool back from 200 to 150 yards, the transportation space of 600 railway trucks was saved.

395 tons of steel were saved in the packing of typewriter ribbons.

By using cadmium instead of tin for solder, 3,000 tons of tin were saved in a year.

Even the varieties of wooden coffins were reduced by 85%.

Here is a field in which the Board of Trade should be far more active than it is. It could do much, but the voluntary co-operation of all individual industries could do more.

See also "Simplified Practice," by Cecil Chisholm. (Chapman and Hall). 12/6 net.

New Style Printed Publicity Despite Paper Restrictions

RESTRICTIONS on the use of paper for publicity and packing has brought about the development of a process of "paint printing" that very largely overcomes the paper difficulty.

For example, if you have many thousands of display cut-outs made seemingly useless because of price alteration or other changes of your product you can have all these existing cut-outs overprinted with the current details. Size, shape or material of the cut-outs matter not at all. They can be over-printed in a way that is a perfect match.

Posters, window bills, cartons, boxes, tins, etc., can be similarly "corrected"

by the paint—printing process, thus bringing them up-to-date.

In addition to direct printing this process can also provide transfers. These of course obviate the need to return the stock of cut-outs, cartons or whatever it is to the works for overprinting. The transfers can be affixed by the user on the spot (e.g. distributed to and affixed by dealers) to effect the same price alterations or other changes.

Posters printed by this process last at least a year. It is in fact equivalent to a painted sign and can be cleaned at any time.

Filmless paint transfers are especially suitable for display on glass windows

as they have all the qualities of a first class original painted sign, with no paper backing or other medium to obscure the glass.

Paint printing has the brilliance of enamel. On paper, card and other flat surfaces it gives the effect of relief or embossing. For posters it has the quality of being one of the few mediums that can be read in the dim light of the blackout—inside buses, for instance.

Paint printing, in fact, seems to be a war time expedient that will develop into a post-war factor of great importance in sales promotion.

Keeping the Dealer Sweet

**The dealer only loses patience when he doesn't understand
Explain your difficulties of supply; demonstrate visually; and his
resentment will be replaced by goodwill**

THEORETICALLY, the dealer is entirely sympathetic with his manufacturer. He knows his difficulties. But in fact about every third dealer has a grievance against one.

A big warehousing concern in Wood Street has particular difficulty in persuading some of the big department stores that they really are giving them all they can. Driven to distraction one day by an extremely irritated buyer, the manager shouted across the phone, "Well, my dear A, if you don't believe me come and see for yourself. I shall be glad to take you round the entire warehouse and show you exactly what we have got. Perhaps that will convince you."

Show Him Your Empty Shelves

As a matter of fact it did. The buyer concerned was in town the following week. The manager took him right round his own warehouse with its acres of empty shelves and its shortages in every line of goods. This physical demonstration worked like a charm. The buyer went away convinced that he had a square deal, that the manager had done everything human ingenuity could conceive to keep him supplied.

This is one of the best methods of tackling this particular problem.

Send Him a Tactful Letter

Then there is the personal letter. Wolsey have put out some of the best of these. I take the following from the very first of these excellent series. It is dated back in October, 1940—half a lifetime away! But with customers concerned, Wolsey's position was just as bad as anybody's is to-day. They could not supply a single number.

"Although our system of rationing has been fair, we do not claim that it has not broken down in isolated instances, and we would take this opportunity of thanking retailers for their sympathetic and reasonable attitude during what has undoubtedly been an extremely difficult period. To those customers who, for one reason or another, we have failed to satisfy, we would offer our sincere apologies, and would add the assurance that we shall do all in our power to rectify any such failure in the future.

"The position at the moment is that, under the Limitation of Supplies Order, we have completed our turnover for the period ending November, and without any exception our departments are now closed, and we are quite unable to make further deliveries.

"Post orders from our customers during the past few days total many thousands, and daily post orders are

being received in large numbers; it will be appreciated, however, that we cannot send deliveries against them, and in view of a depleted staff we are not able, unfortunately, to send a personal letter of explanation to each retailer concerned. Because of this, we hope that this letter will serve the purpose of explaining just how we are placed and will be regarded as an answer to any orders which may have been mailed to us during the past few days."

This letter is frank, it is specific, and it has a friendly touch.

The general situation is even more difficult now. Many dealers resent every inch of consumer advertising as landing them into some trouble with the customer. But it is possible to get round even this difficulty, and I think that this copy of Wolsey does it.

Help for the Bombed-Out Dealer

Most difficult of all is the case of the customer who has been blitzed. In fact, we can do a good deal for him, thanks to the exceptions allowed for in the Restriction of Goods Act. Certainly we can replenish his stocks, if the goods are available.

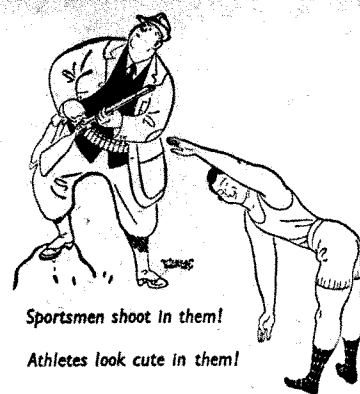
But one can do more than that. A concern in the woollen trade has specially trained a traveller who is detailed to visit any area which has been blitzed. Naturally he is a man of sympathetic personality. He has been given special training in the easiest and quickest methods a retailer can use to get repayment under the Government scheme for lost stocks. He has the company's sanction to rush stocks to the scene so soon as the retailer has a dry space in which to put the goods. Experience has made him a walking encyclopaedia of blitz-time wisdom.

Thanks to the service this traveller is giving, the firm is not merely certain of retaining its accounts with blitzed concerns, it is also reasonably sure that this special service will be remembered when the post-war scramble for business comes along.

Explain How Simplified Lines Help

I hear of a number of firms who are compelled to reduce the number of their lines drastically, on account of difficulties with supplies of raw materials. But the simplification of lines pays hand over fist at the present time. It is infinitely cheaper to produce 10,000 each of 50 lines than 5,000 each of 100 lines. This means that the manufacturer can give a slightly better product.

The difficulty comes in proving this to the dealer. He is apt to feel that this is just another burden pushed on to his back.



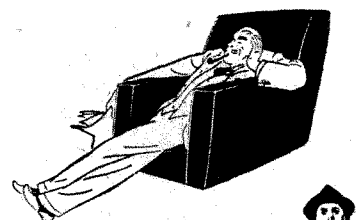
Sportsmen shoot in them!

Athletes look cute in them!

Men who love comfort
simply take root in them!

Wolsey pullovers, underwear and *socks!

*Cardinal, of course!



Wolsey



★ If your favourite shop runs short of Wolsey—
don't blame them. Remember, "there's a war on!"

*This advertisement "keeps the
consumer sweet" for the dealer.*

The remedy is to explain to him carefully the benefits that result from this method. It enables the maker to keep prices down for his customers: it allows the dealer to reduce his stocks to fast selling lines only. But several letters and possibly a folder may be needed to prove the case.

Above All, Keep Traveller-Contact

Another solution of the problem is continual traveller contact. Many of the great food concerns, whether they use wholesalers or not, have hundreds of travellers on the road placating the irate dealer.

There are two weaknesses for smaller firms in this policy. The first is the cost, the second is the trouble of keeping it going as more men are called up for the Services.

On the other hand, a seller's market is an easy market. To-day, as in the last war, many concerns are allowing the wives and sisters of their travellers to look after their areas. Territories are also being pooled to a large extent.

Finally, there is the use of the house organ to keep contact. Even under a paper shortage it is still possible to issue a small house organ in most cases. Into this can be packed both arguments that defend the manufacturer to the dealer and others that defend the dealer to his customers.

The more informal such a house organ is, the better. Many of them are far too stilted and far too preachy.

We Get the Best Results From "Bevin Girls" This Way

By an EXECUTIVE
Of a Midlands Firm

WE know a good deal about women workers in Leicester, for here women have done factory work for a century or more. Brought up in this tradition, they mostly like their work.

Perhaps this is why the latest figures show that 70% of our women workers are married. But most of these women are naturally employed in the great Leicester hosiery industry and in the boot and shoe industry.

The work in the first of these is ideally suited to women. This is not so true in the manufacturing and building of machinery. So before the war only 250 of our 1,500 employees were women. To-day we have 500 women workers out of about the same total. But for two years we've been in the position which many engineering concerns now find themselves in for the first time. We have had to train women unskilled in our business as efficiently and rapidly as possible. Incidentally we can obtain no skilled worker of any kind, as we are only manufacturers using mass production methods for the large scale production of our goods.

In a town like Leicester the finding of even unskilled women workers is not easy, for the habit of working rather short time in the hosiery trade appeals greatly to women. Every woman likes an extra half day in the week for shopping and getting her housework done or for going to the pictures.

Nor are we able to engage any worker unless submitted by the local Unemployment Exchange. Not only are we limited to the Leicester exchanges but our town has actually been asked to supply labour to other centres for war work. Under present conditions we find that the one certain way of securing a good type of girl or woman worker is through one of our own people. The foreman or manager who has been sympathetic or helpful to some woman worker will be the first to be told of a capable friend who wants a job. In a business of medium size it is not worth while to open a special school. With us, as with the majority of firms who will be affected by the new Ministry of Labour instructions, the job of fitting women into their new jobs will rest largely with the foreman.

So soon as the new girl joins us she is given a careful, personal instruction in her first job by the foreman. She is then put alongside a trained worker and the foreman makes a point of keeping away from their work. We find that new women workers are extremely nervous when watched in their first efforts by skilled men or their superiors.

The trained worker to whom the



She Knows Her Lines

The M.G. Car Company make it easy for new woman workers on jobs entailing the drilling of tens of thousands of holes of many different sizes.

Each size is allotted a colour and drilling jigs have coloured lines painted on them from hole to hole. For example, all the $\frac{1}{8}$ " holes have a green line connecting them, all the $\frac{1}{4}$ " a pink line. By issuing drills with the top portion of the flute bearing a corresponding colour, the use of the right size drills for the right size holes needs no engineering knowledge. Send YOUR new idea along!

novice is attached continues to do her job, while the new girl simply watches. If the worker is using a micrometer, for instance, she will carefully explain to the girl how to read it before letting her use it occasionally. After a couple of days the novice is accustomed to the tools she is to use. She is then given work of her own. Meantime she is paid a straight wage until she is capable of earning a bonus. This wage is paid from two to four weeks. The straight time rate for a 47 hour week works out at about 38/- for a girl of 21 and correspondingly less for a junior.

When she is efficient, the novice is able to begin earning a bit of a bonus. Eventually she would be able to earn 7/6 to 10/- a week extra. But finally she may be put on piece work where she may earn a good deal more.

We use the Rowan system of bonus. Under this we pay the worker for 50% of the time saved on each piece on the time set by the stop watch.

The variety of work a woman can

now do is astonishing. We use women on drilling, light capstans, light grinders, preparatory work for electrical plating (such as wiring, etc.) and for small automatic and semi-automatics as well as for viewing and gauging and the assembly of small parts.

We don't use women where a screw driver is necessary. Our experience is that the feminine wrist is not strong enough for this work. But its deftness is useful in fitting small wires into slots and all delicate operations in assembly.

Recently we have found a number of delicate little jobs which women do twice as fast as men. Yet we had never thought to put women on any of them before.

Conversely, we have put men workers on jobs always done by women when we were not allowed to use women for night work. In some of these cases we found that men were better suited for a job requiring a certain amount of physical effort.

THERE IS A REASON WHY THIS SIMPLE WORKS COUNCIL WORKS SO WELL

By an Executive of Fredk. Braby and Co. Ltd.

MR. Bevin has been saying some hard things about employers' relations with their workers. In particular he criticises the failure of many firms to look after working conditions and to keep human contact with their people.

The real difficulty is that when anyone employs more than a couple of hundred people at one works the old family touch is bound to evaporate. We are often told at Braby's that the firm has been singularly successful in keeping the family atmosphere.

One element in this success is the keen realisation by our directors of this danger. From the fact that Braby employs over 3,000 people, the danger has been obvious. One means of averting it is de-centralisation. We have nine factories and depôts in various parts of the country and each of these is encouraged to regard itself, as far as possible, as a separate business.

We Keep the "Family" Touch by De-centralising

At Deptford we have about 600 workers. After 75 years of existence, the workers still regard themselves as a family business. From time to time, they see one or other of the Braby family about the works. Seventy-five years of care and attention to the workers' welfare lies behind this exceptional good feeling.

That is one reason why the Works Council which we started in 1917 has been such a success. Another is its simple constitution and the democratic way in which it is run.

The Council consists of:—

The London general manager and director (chairman *ex-officio*).

A deputy chairman elected annually (usually a workman).

The works manager.

One elected member of the office staff.

All foremen (9).

Twelve representatives of the employees, below rank of foreman.

The secretary.

The welfare supervisor.

Elections to the Council are made by vote of the workers. The voting qualification is 12 months service with the firm, and the age limit is 18. To stand for the Council a man must have three years service and be not less than 21 years of age.

We have never split the Council up into a number of committees, but it works in close co-operation with the

Safety Committee (which reports to it quarterly) and with the Suggestions Committee and with the welfare supervisor.

The Council's most vital work is caring for conditions of health and well-being in the workshops. All accidents are reported to the Council, whether strictly "reportable" to the Factories Inspector or not. We often find that a minor injury has been caused by something which might have led to a serious injury and in many cases prevention is possible. We have had several cases where further accidents have been avoided by the reporting of quite minor injuries.

One difficulty in every works to-day is the tendency to keep machines running long after a fault has begun to develop. The following comment from our Safety Committee on this point shows how keen our people are to shoulder any responsibility.

When work is pressing and output is of such vital importance, there is the tendency to keep machinery working as long as possible without reporting a need for repair, or when a report is made there may be reluctance to take men off directly productive work to attend to a machine which, though at fault, is still giving output. When labour is short, it might seem, on the face of things, that it is a waste of good time to detail men for inspection to look for faults which may not exist.

To give attention to these various matters does not, in the long run, waste time—it gains it.

Safe conditions, apart from ensuring that there is no worker absent due to accident, make for easier and better production without the loss of time caused by imperfect work. Early attention to repair saves time and well repays the initial delay.

Workers Know We Look After Their Safety

It is the Safety Committee's experience that inspections are vitally important. Arising from its own recent works inspections, the Committee wishes again to emphasise to all machine users the importance of the need for quickly reporting to the foreman, or others concerned, the development of any fault. See that the starting gears are kept in proper order. Do not arrange work in front of machines or lean plates or partly prepared work against them in such manner as to prevent the ready operation of any stopping device.

To all we would say—do what you can for safety. It is a contribution to the national effort.

While suggestions are dealt with by

the management in order to save time, awards are received by a committee which is responsible to the Works Council. In this regard we have learned how to avoid one continuous source of grievance. While in many cases the suggestion may not prove after a year's practice to be nearly so useful as was hoped, there are cases where the suggestion leads to a change which is more valuable than was anticipated. Such cases are reported to the Works Council. In more than one instance the original payment made has been increased after an interval of time.

One of the functions of the Committee is to assist us in avoiding waste. I cannot say we were too successful in this field before the war. It is one of the most difficult to deal with at any time. But to-day we are having valuable hints from the workers on waste. In one case we were shown a method of clearing scrap more rapidly; in another a more efficient method of cutting plate was suggested which resulted in economies in metal.

It is not too much to say that the Works Council is gradually becoming the centre of our communal activities in the works.

Curiously enough, in 24 years of operation we have only met with one tiresome member who really wanted to sabotage this piece of social machinery. Normally everybody works most unselfishly for the common good.

The reason why we have such a good spirit is, I think, the care which the management have always taken to keep the personal touch and sincerely to accept responsibility for the welfare of their workers.

More Time For Claims on Railways

It has been agreed by the Associated Railway Companies that in regard to Condition 8 of the Standard Terms and Conditions of Carriage, an extension of time will be allowed purely as a wartime measure to assist the traders.

In regard to complaints and claims for damage and pillage; the time limit has been extended as follows:—

Complaints in 3 days and claims in 7 days, to 6 days and 10 days respectively;

and with reference to total loss, date of complaint has been extended to 21 days and claim within 35 days, against 14 and 28 days respectively.

AN ACKNOWLEDGMENT

IN our January issue, page 18, we published an item: *Modern Stock Control Cuts Costs at These 9 Points*, but by an oversight omitted to acknowledge the author of the material. The Nine Points were taken from "Stock Records," a very complete little handbook on this important aspect of management by W. A. Smith, F.C.W.A., and published by Moores Modern Methods Ltd., 12 St. Bride Street, E.C.4.

What Type Man to Select as a War-time Budget Controller?

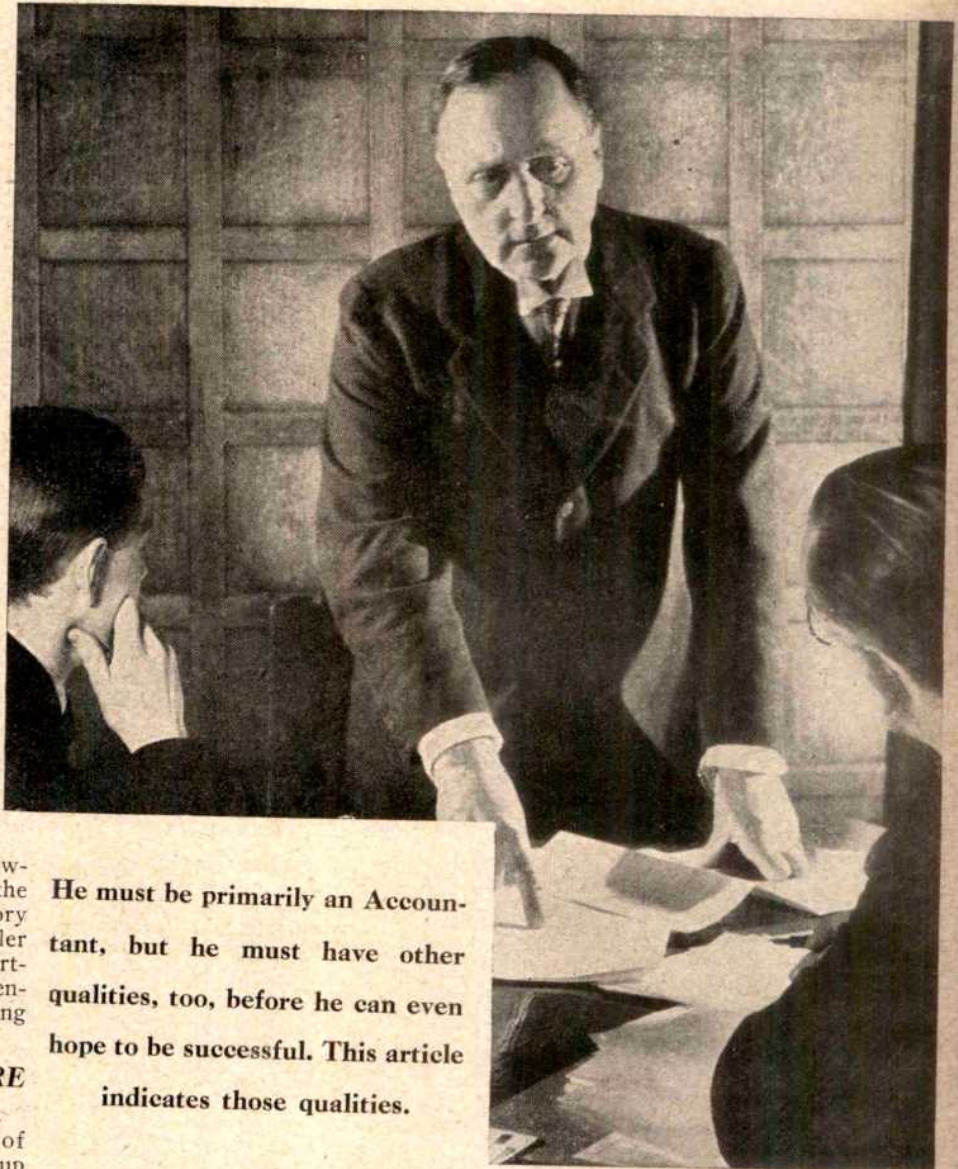
IN Business Administration before the war more and more emphasis was being placed on Budget compilation — Sales, Buying, Cash, etc. The controlling was left more or less in the Chief Accountant's hands but he was generally far too busy to give the detailed control that is so essential to effect a correct ratio of costs and profits. The war has brought about a peculiar condition in an attempt to limit profits, prevent inflation and to control price levels. The Business Administrator must therefore keep before him *day by day* the working costs and selling conditions to ensure that a satisfactory position is maintained. There is only one way to do this, the appointment of a Budget Controller.

While it is a *sine qua non* that an accountant of some commercial experience should be the budget controller, a chief accountant cannot effectively attend to and control the up-to-the-minute details of a pre-determined budget. He is too preoccupied with the administration of the accounts department to have the time to spare every day to watch costs.

Apart from the time element, however, there is also the location of the accountant compared with the factory or workshop. The budget controller should not be attached to any department; he should be mobile, independent: he should be the managing director's right-hand man.

Control Must Operate **BEFORE** Expenditure is Made

Recent experience in the selection of a budget controller for our small group of companies having a separate servicing company showed that an auditor had not the right training or outlook to operate the control *before* expenditure had been incurred. He seemed the ideal man for reporting on the position as presented by the budget compilation but he was not resilient enough to cope with the changing scenes, e.g. in the sales budget. Nor has a highly qualified accountant necessarily the right qualities of contacting with other departmental executives to ensure *flexible* adherence to the budget. Therefore while the first essential in the selection of a budget controller is general accountancy, experience for control in any sphere of activity is only capable of efficient application if the controller understands the basic principles underlying



He must be primarily an Accountant, but he must have other qualities, too, before he can even hope to be successful. This article indicates those qualities.

By H. W. FULFORD,

Head of a Group of Small Manufacturing Firms

the control. Emphasis therefore should be not merely on the best accountancy experience but also on the controller's training and experience *in association with technical men and women*.

Secondly, the controller must have an authority equal to his task. We prefer that he should earn this authority by his own resourcefulness and imagination than be given a paper authority which so often offends the very people he is trying to control.

He must be known, of course, as the Budget Controller and his functions clearly defined to the company executives. If a departmental manager has

been indifferent in signing expense vouchers without reckoning the little extras he may resent an inquisitorial "Why?" from some one he knows is in receipt of a salary far less than his. Hence the controller must be a good mixer. And that brings us to the third quality and probably the most important—resiliency.

This Quality 'Resiliency' is Most Important

The controller may have to remind the chief accountant that collections are not up to budget standard at the

(Continued on page 28)

"Output will be Quadrupled if we do Today's Job Yesterday . . ."

Says **WILFRID AYRE**,

Chairman, The Burntisland Shipbuilding Co. Ltd.

TO-DAY in the shipbuilding industry there is most urgent need for the intensified production of new ships. But it is easier to proclaim our needs than to fulfil them, and although we hear much clamour for increased ship production there are but few concrete suggestions as to how best this can be immediately achieved.

New Methods: New Planning At Every Point

I believe we shall obtain best results by getting down to the heart of things . . . by examining the elimination of man-hours from non-essential operations, or the shortening of production processes by speeding up in the shipyards the flow of materials from railway truck through workshops, and machines to building slip; or reducing the total load of work—manual and machine—by designing improved types of structure, where complication gives way to simplicity.

In short, we must employ new methods favourable to expedited output and best fitted to the facilities available in individual shipyards . . . and then organize, plan and drive remorselessly on to new records of ship production.

Furthermore, if we chose to grapple with the problem of *laissez faire* and in its place to infuse a resolute spirit of doing to-day's job yesterday instead of to-morrow, we could view the seriousness of the present shipping situation with lessened anxiety.

That the Supply Departments responsible for rationing and directing the flow of materials to thousands of munition works, factories and shipyards, have in the main been successful, no one will deny. But, at the actual centres of production, whether the transformation be ingots to guns or shells; steel to ships or tanks; pig-iron to marine or airplane engines, there are problems demanding constructive thought and speedy solution, by employee and employer alike; problems that, in some way, can be solved with greater advantage to urgent national requirements than by merely preaching to the converted that "we must have more production."

Loyal Co-operation Of All Hands Is Essential

It might be suggested that much of what I have said is answered by Proper

Mr. Ayre is speaking mainly of merchant shipbuilding but what he says is fundamental: it applies, absolutely, to every kind of industrial production. Mr. Ayre asserts that modern methods of management and organization applied more intensively in our shipyards would meet the fearsome toll of sinkings, and would in fact have prevented the perilous situation in which the nation is now placed by the rate of replacement building being so far behind that of losses by enemy action.

As in every manufacturing field the Reduction of Man Hours Per Job is the key to expanded output. Mr. Ayre is working on this problem in his own organization. He says even the proper planning of odd jobs (to cut down time wastage) can shorten the completion date of a ship by from 4 to 8 weeks. Imagine then the effect of intensified control over the whole building of a merchant vessel. By the firm resolve to do, as he puts it, Today's Job Yesterday, Mr. Ayre proclaims that British Shipbuilders could more than close the gap between sinkings and replacement.

Management. But even the best administration must have, and deserves, loyal co-operation between all grades engaged in the production effort, and particularly is this necessary in a time of national peril.

In organizing for shipbuilding much can be gained from the widest application of short-, as distinct from long-term planning. The sum total of man-hours expended in the building of a ship, an engine, or anything else, is the yard-stick of industrial effort. The necessity for efficient distribution of labour personnel in present circumstances requires that every operation, manual, or mechanical, should be planned with the object of stripping production of every non-essential man-hour.

Time Can Be Clipped From All These Jobs

For example, time saving can be effected by planning the preparation of riveting berths well ahead of the time when riveters are due to transfer from their previous job of work. This will eliminate unproductive pauses in continuity of output and avoid periods of temporary unemployment of skilled labour.

Planning to obviate the customary assemblage of scattered jobs, usually small in extent, but invariably large in number, exerts a vital influence on the

final delivery date. Unplanned, these jobs hamper the finishing stages of a ship. It is no exaggeration to say that proper planning of odd jobs can speed up the delivery date of a ship by four to eight weeks.

We can plan to ensure that every sectional operation is correctly synchronised to fit in with the pre-arranged building schedule or to beat that schedule instead of lagging behind it. Again, we can plan for timely delivery of the countless items purchased from an army of subcontractors. Experience shows that late delivery of a single item can disorganise completion of the whole ship, and, worse still, retard the production speed of the ship following on.

Simplification PLUS Elimination Of Redundant Effort

In war-time, merchant ships must be shorn of superfluities as distinct from necessities, and specifications to the bare needs of sea transportation. A large measure of simplification has already been introduced, partly by force of circumstance, and partly by the essential requirements of economy. But this measure will not, by itself, speed up ship production or drastically cut down the time element to the extent required in the present emergency.

Simplification to be effective must also deal with redundant effort. Because



there is often another and possibly a better way of doing a thing, we can re-design the integral parts of a ship's structure with the object of improving strength and reliability yet economising in material and man-hours. Redundant effort, whether in the form of material or labour, absorbs time and cost. If we can minimise it, the gain is two-fold.

Riveting—the pacemaker of present-day ship production—is a fruitful field for elimination of redundant effort and equally valuable for time saving.

In a 10,000 tons d.w. merchant vessel, where only a moderate amount of welding is employed, there are some 500,000 rivets. Every one per cent. saving in riveting volume will clip the time element and add a corresponding amount of tonnage to the nation's food and munition carrying power.

More Mechanical Aids Intelligently Applied

The greater use of mechanism to replace manual operations is an obvious asset for time saving in ship production, but, there again without co-ordinated operational planning, mechanization can be as ineffective as manual process work that lacks supervision or direction.

The manufacture of motor cars is an outstanding example where reduction in production time by mechanization and highly organized planning was a stark condition for the survival of the efficient in an industry faced with the internal strife of fierce world-wide competition. The result now is that manufacturing methods between competing plants, in effect, can be said to differ mainly in respect of the rate at which a moving assembly belt can be speeded up, the operations likely to slow it down simplified or eliminated and then the final number of minutes to which total production time can be reduced. If similar expedients are not completely applicable to shipbuilding, (though America succeeded almost in adopting them in the last war) we may, at least, have a look at the production methods of other industries, if only because, admittedly, there is yet scope for much time saving in our shipyards.

I believe that planned production control can do this. It is true that much has been done in recent years to improve the output and competitive ability of the British shipbuilding industry. But, while we may salute the achievements of the past, we must remember that our critics have credited us with an *embaras de richesses* in this respect, therefore with a man's job to do now, we need to take off our coats to the needs of the Future.

Here Time is Our Enemy, Not Our Ally

Time is the essence of the merchant shipbuilding problem; vacillation its greatest handicap. Delays, whether they arise from irregular deliveries of

How Have War Conditions Shifted Your Customers?



We Concentrated Distribution This Way

By F. H. KELLY,

Advertising and Sales Director, The Portland Shoe Co. Ltd.

WE are limited to the use of 80 per cent. of the upper leather used in the first nine months of 1940.

At first sight it might appear that if the control applies to upper leather only, a substitute could be found. We are forbidden, however, to change the essential type of shoe made prior to rationing. For instance, if we used *leather* for uppers before the war, we must continue to use it; we cannot make children's shoes if before we made ladies'—we cannot use canvas for uppers or a larger quantity of bottom stuffs for shoes than previously.

The BUSINESS reader will appreciate in a flash that this method of rationing is much fairer than rationing by value, imposed upon so many industries. It is based on *material* used not on the selling price—It is based on *Production*—Not on *Sales*. In hosiery, for instance, total sales by the dealer must not exceed 50 per cent. in *value* of the previous turnover. With prices rising continually, this means much less than 50 per cent. in the weight of the goods.

In fact most shoe firms are working to full capacity—under present conditions—as owing to curtailment of labour the slack left from the home market is taken up by Government orders of one sort or another and by the imperative necessity of filling every export order that can be landed. Extra rations of leather are granted for these orders.

Mixed Production Causes Greater Overheads

You will observe that this loads manufacturers with a pretty production problem. Obviously, the types of shoes on Government order are not those sold to the home market but much stronger and stouter goods. At the same time many of the shoes sold abroad, for instance to Latin America, are suited to different climates. The women's wear required by a Buenos Aires fashionable, for instance, is as elaborate and stylised as anything ever seen in pre-war Bond Street.

So that the manufacturer is unable to enjoy the normal benefits of working his machinery to capacity. The use of highly standardised materials is difficult for other obvious reasons. As a result, sales overheads will normally tend to rise rather than to fall.

In this concern we are fortunate in having applied a measure of concentration to our distribution over the past few years. The bugbear of our industry is the infinite variety of sizes, fittings and styles imposed upon us by the variations in the human foot and

the entry of shoes into the fashion class. Since the last war the range of shoes manufactured has tended to increase every year to meet the whims of fashion no less than the more exacting demands for comfort.

We were fortunate in seeing this danger from the first. We felt that the demands for space and capacity being made on the average dealer were getting out of hand. So we decided to remain with the wholesaler rather than to deal direct with the retailer, or open our own shops as so many of our friends have done. (We were already working through the wholesaler at this time).

Our Method Saves Dealers' Space and Capital

The revolutionary part of our concentration scheme consisted in getting 50 wholesalers (recently increased to 70) to stock our entire range of shoe styles, so that the retailer could rely on immediate supply of anything and everything he wanted at the shortest notice. The motor van has brought such service well within the power of the efficiently organised wholesaler. In other words, we concentrated a great deal of our sales and stock carrying problem into 70 units, instead of spreading it equally over the 3 or 4,000 dealers who carry our shoes.

At the moment we are busy simplifying our range so that still further economy can be made in production and selling. I need not point out that even present arrangements are not perfect. But our method of marketing enables us to save the dealer an enormous amount of shelf space and capital outlay while reducing our own expenditure in the same directions.

But what of the price you pay? I can hear some reader ask. You have lost direct contact with your selling agents. You don't know what they are thinking or doing. How can you possibly make up for this fatal loss of sales control?

The answer is that we have been able to do something rather unusual in this sphere also. We keep direct contact with each of the wholesaler's salesmen by two means.

We supply each with a guide to all our lines that is unusually comprehensive and helpful.

We explain everything we are doing to each salesman at intervals. Our service in this way has brought me (by the law of lesser concession) the privilege of speaking to salesmen at their own warehouses and of explaining our suggested methods of selling to customers in considerable detail.

Sometimes we meet the salesmen at their home office on Saturday morning. At others we have a little dinner first and then a talk. The result is that we feel we know personally every salesman handling our goods.

Few firms seem to realise what splendid co-operation one can get to-day from first-rate wholesale houses. We are able to work through these 70 houses on our complete list of 3,000 to 4,000 dealers, whom we have classified according to the type of shop, the turnover and class of goods required.

Until the war we supplemented the work of the wholesalers by courtesy travellers whose job was to see that every dealer was getting supplies and to remove any cause for complaint. We are still carrying this out in a limited way.

Our wholesalers' agreement enables this co-operation to be kept up continuously and without friction. The wholesaler agrees to keep complete stock of all our numbers. This he agrees to do, not merely at the peak sales seasons, but throughout the year. He agrees to maintain fixed prices and to show a full display of samples in his own warehouses and to cause every traveller to carry a representative range of samples.

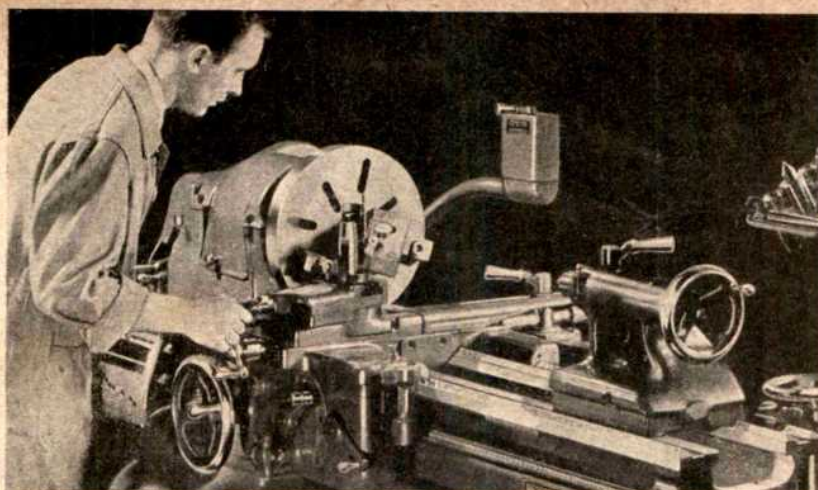
In our turn, we undertake to include the names of such firms in our special list of principal agents which we advertise to the retail trade and to refer to them our trade enquiries.

In addition, we allow such wholesalers every possible advantage in the matter of terms and service. This includes participation in our "clearing house" arrangements with regard to discontinuing lines. When a line is discontinued, we give the dealer three months' notice and start to inter-change among the dealers at once.

This Method Also Simplifies Our Accounting

The chief services we have found from this system are precisely those needed under present conditions. For we require to carry less stock ourselves, our dealers are relieved enormously of a similar burden and our accounting problem is simplified by handling 70 accounts instead of 400. Yet we have most of the advantages of a direct-to-dealer system.

As the shortage of materials becomes more acute, as more travellers leave for the Services, I expect that many concerns may find it useful to try the modern method of wholesaler-retailer sales distribution such as we are using.



By
The **STATISTICAL OFFICER**
of a
Well Known Manufacturing Co.

Preparing Post-War Business NOW

IN a company manufacturing a number of products that are famous throughout the aircraft and general engineering world a statistical research department is an obvious part of the organization.

But in the majority of firms of this kind statistical research is confined pretty well to the field of technical design and production. In this company however, it goes much further. Statistical research is not merely a component department, it is the entire business, or rather the basis of it.

A few years ago this company was a modest concern indeed. Today it has large modern factories in the London area and in Lancashire and is acknowledged to be one of the most pro-

Though working fully on armaments this firm's research experts are studying changing needs, anticipating products for post-war use and making forward plans for the manufacture and sale of future lines.

gressive concerns in the field of technical engineering. This growth was directly attributable to "statistical research" which can best be broadly described as investigation beforehand to find out *everything* about any product with which the company proposed to concern itself.

That word "everything" is, literally, true and all-embracing. It includes full

and accurate data on factors such as those included in the accompanying tables, and other special factors besides.

Thus it will be seen that no product is ever handled before the result of handling it has been exhaustively examined.

This must not be confused with market research only. Certainly much of the investigation bears upon market-

Organization and Production studies needed by a Manufacturer prior to Capital Investment in the Production and Marketing of a new Industrial Product. Chart No. 1.

CHART No. 1

Sources of Ideas for New Industrial

Products

Manufacturer's sales and service staff,
Distributors,
Industrial consumers,
Competitors' merchandise,
Non-competitive goods which need complementary equipment,
Research and production engineers,
Independent inventors.

Major Purpose for which New Industrial

Product will be Made.

To complete line,
To expand sales in present market,
To meet old need more effectively,
To anticipate a changing need,
To meet a new need,
To use idle time of plant and equipment.

Design and Engineering Factors.

What are the known market desires (size, shape, price, efficiency, simplicity, etc.?)
What are the known market prejudices (size, shape, price, efficiency, simplicity, etc.?)
What effect will design have on cost of manufacture?
What effect will design have on simplicity of operation and/or repair?
What is the efficiency factor of the new item?

Is the design easily adapted to minor changes?
Will the item be produced as a single unit or a complete line?
Has the new item been fully tested under actual service conditions?

Production Factors.

Can present labour produce the new product?
Is special labour available if needed?
Can the new product be made with present machinery?
Will production of the new item be seasonal?
If so, what per cent. of time will part or all of plant be idle?
Can plant run on other goods in off season?
What effect will seasonal operation have on costs?
What effect will production of new item have on regular production schedules?
How will codes or other agreements affect production volume and costs?

Material Factors.

What raw materials will be used?
Where are raw materials available?
Are raw material sources dependable?
In an emergency interrupting the normal supply of raw materials, what can be substituted?
What effect will transportation costs of raw material have on final costs?
Are constant and dependable transport facilities available for raw material?
What new storage capacity for raw material and parts stocks will be needed at factory?

Service Factors.

Will the new product need service?
If so, to what extent?
Will service be rendered by the manufacturer?
If not, by whom?
What spare parts stocks will be needed?
Will spare parts be sold at cost or at a profit?
If service is rendered by the manufacturer, will the customer pay for it directly? On what Basis?
Where will service men and spare parts stocks be located?
What special personnel will be needed for service work?
What effect will service factors have on costs?

New Capital Investment Factors.

What changes will be needed in present plant?
What new real estate investment will be necessary?
What new roads, sidings, power lines must be built by the company?
What new buildings will be needed?
What new tools will be needed?
What adjustment to present production machinery will be necessary?

Relation of New Product to Regular Line.

What is the relation in quality?
What is the relation in manufacturing methods?
What is the relation in field of use?
What is the relation in type or general character of goods?
What is the relation in price levels?

ing but it actually embraces the entire activity of the company, including policy.

How Research Finds Facts For Future Business

In addition to looking after the company's current and immediately future programmes this research department probes far into the distance and is now actively planning for post-war business.

For example, close investigation is being made into the condition the motor car industry and market will be in when the post war period starts.

Car manufacture in Britain for the general user is of course virtually closed down. Nevertheless, this company's statisticians are gathering from all sources data as to what improvements military experience is developing in car design and manufacture; what American technicians (not so held up by war) are producing for the future car market; what aircraft experience is suggesting to motor car design; what advances are being made in new metals, new tools and new materials; what changes (if any) will come about in British motoring conditions and among car users as a result of the war.

All this information is being sought and tabulated for use when the company will again produce technical components or accessories for the motor industry.

Similar research is being done in the field of radio; and in fact in every technical field in which the company is interested.

Simultaneously data is being recorded in regard to such things as whence come the supplies of certain of the rarer raw materials. Information like this is vital when considering the future production of a highly technical product that depends for its effectiveness on some material coming perhaps from only two places in the world.

This actually was the case in connection with one product the future manufacture of which was being contemplated. The discovery of this precarious supply of an essential raw material consequently led to research along the line of discovering more certain supplies of something that could be substituted. Within six months the company's scientists created a material (a combination of a more common element and a synthetic product) that proved by actual test to be just as good as the original thing and about one-third the price.

Now, if and when that product comes on to the market after the war this company will enjoy an enormous advantage (initial advantage at any rate) in regard to its manufacture and sale.

New Products Are Sought For Future Development

In addition the company constantly advertises for new ideas and new products evolved by inventors and scientists. All these the company

examines with a view to their possible development in the future.

In the course of a year hundreds are looked at. Many are dropped at first sight but those that appear to have possibilities are then exhaustively examined, to the full extent, if necessary, of the two tables reproduced in small type. But before that, the proposed product is considered from the point of view "Is it the kind of product with which it is policy to have our name associated?" By this is meant, will it be a product that can expand the prestige of the company and add to its reputation as producer of the finest things of their kind obtainable?

This question is, in fact, the most vital test of all.

Keeping Up-to-Date Also For Current Business

In connection with post-war business for our already established products it is also vital to make research. Our lists of customers are constantly being revised. All the many alterations made necessary by the war are most carefully noted and recorded: people get bombed out and do not immediately restart

business, others open up somewhere else, many evacuate, some close altogether . . . etc., etc.

For this information we comb our trade papers, also our still existing sales force record on special forms (which they submit daily to head office) all such facts that they can discover at first hand in their respective areas.

By this means we are able to keep our mailing lists up-to-date. Such adjustment is of course valuable even today as we still do a fair amount of postal propaganda, but its main objective is of longer range and is designed to put us in a good position to open up heavier barrages of direct mail when the war is over. Obviously it will be quite useless and unnecessarily expensive to start the post-war drive with pre-war or war-time mailing lists.

In a short article it is not possible to mention more than a fraction of the fields covered by this company's research. Beyond the very brief references already made the following are examples:

If any one of thousands of raw materials come into question statistics
(Continued on page 29)

Organization and Production Studies needed by a Manufacturer prior to Capital Investment in the Production and Marketing of a new Industrial Product. Chart No. 2.

CHART No. 2.

The Market.

What industries will use the new product?
What is the geographic location of potential customers?
What is the growth projection of industries composing the market?
What is the consumption of comparative products in customer industries?

Buying Habits of the Market.

What is the title or position of the person who places the order for this type of merchandise?
What is the average number of people who must be contacted in each customer-firm before an order can be closed?
What is the average time needed to close a sale?
What relative weight do buyers give to price, quality, service, safety or other qualities of this and similar products?
From what sources does each of the potential customer-industries procure its need for this and similar products?
At what season is buying done?
What are the practices on discounts, allowances, credits, other financial facts?

Firm Relation to Market.

Is the firm already established in market using new product?
Is the reputation of the manufacturer (size of firm, character of merchandise, or any other factor) capable of constructive exploitation in the new market?

Competition.

Who are your competitors in the new market?
What is their standing with the potential consumers of the new product?
Will marketing the new product invite more or keener competition on the regular line?
Can any competitor bring out a seriously competitive product quickly?

Seller's Price Policy.

What, in general, will be the price policy on the new product?
What will be the schedule of discounts and allowances?
Who will be entitled to discounts and/or allowances?
What new credit facilities will be needed?
What differences will there be in collection policy?

Channels of Distribution.

Is the market subject to wide fluctuations, seasonal or otherwise?
What type of distribution will be used? i.e. Manufacturer's sales branches? Manufacturer's agents or distributors? Home office sales agents or distributors? Home office sales force to wholesalers, etc.?
Will the product go into the export field?
Where will stocks be maintained?

Sales Promotion.

Will the new product have its own sales promotion set-up?
Will a new advertising section or department be needed?
What type of advertising will form the basis of the opening promotion effort?
Will a new or extended agency connection be necessary?
What, in general, will be the basis of the appeal?
What will be the basis of the sales promotion budget?
What promotional work is being done by competitors?

Management of Sales Force.

Does any visible factor of the marketing problem indicate that a special sales staff or a special sales department entirely separate from the sales organization handling the regular line will be necessary?
Will salesmen "sell" or "negotiate"?
Will additional salesmen be needed?
Do salesmen need technical training?
What special aids, i.e.: engineering, research, advertising, etc., will be given to the sales staff?
What will be the basis of salesmen's compensation?

Others.

Is ownership of the new product established?
Is its trade-mark protected?
Are all claims to royalties or other indemnities settled?
Do royalties limit the market for the product?
Do trade agreements limit the market or sales effort?
What are the effects of codes on sales methods? competition?
Have all transportation problems, including rates, yard and switching charges, speed of handling and costs been given full consideration?
Have local tax problems and other civic problems been solved?

Fitting the Bonus to the Job

By using *nine* different, carefully adapted bonus schemes, this firm secures maximum keenness in each department



OFTEN only one or two departments in a business work on bonus schemes. This often leads to the attitude on the part of employees—"What's the use of making an extra effort in the department I work in, when other departments may nullify the effect of that effort?"

Boxfoldia Ltd. have had the imagination to devise nine separate bonus schemes, each specially adapted to the particular department in which it operates. This is how they do it.

Forme-Makers' Bonus.—For every forme produced in this department a fixed bonus is allowed irrespective of size or type. The allowances are totalled weekly and allocated to each member of the department in the proportion that his wages bear to the total wages.

Packing Department.—Members of this department are paid a fixed amount per ton on goods despatched; this amount is divided between all members of the department in proportion to wages earned.

Board Stores.—A bonus is paid to the board store employees on the basis of the amount of board and parcels of cartons shifted each week. There is a complete scale of rates dependent upon the distance that goods are moved. An allowance is made to the department to cover the tonnage at the specified rates; the wages paid on time basis are then deducted from this and any balance remaining is divided equally between the men in the department. The men are allowed to draw up to 25

per cent. bonus and carry forward any credit. On the other hand, if the allowance on this piece-rate scheme falls below the total wages paid, the debit is carried forward and becomes first charge on the following week's bonus.

Cutting and Creasing.—The bonus to cutting and creasing machine-minders is paid on output additional to a basic number of runs. The rates vary for different types of machines and there is a sliding scale by which a man with a higher basic wage receives a lower bonus rate than a man with a lower basic wage.

Apprentices' Bonus.—In most cases, apprentices are paid a standard weekly bonus which is indicated to them at the time they sign their apprenticeship indentures, payment being subject to good behaviour and satisfactory reports on progress from the supervisors.

Lining.—Lining department employees receive a "group" piece-rate based upon the number of yards they produce weekly. Extra earnings are divided between the members of the department according to their minimum rates.

Good Record Bonus.—An annual award is made to machine-minders for avoidance of mistakes, accidents or breakdowns on the machine. This award of £1 is made individually to each man after he has run a full twelve months without any mark being made against him on the above score.

Quality Bonus.—Each letterpress printer is credited with a certain amount for every job he runs against

which there is no complaint or query, either at the time the job is run or later. The actual amounts credited vary according to the different runs. Payment of the resulting totals is made each three months, up to the end of the previous three months, so that there is always a lag of three to six months between payments.

Service Bonus.—The printing services, namely, the composing, stereotyping, photo-engraving, photo-litho, gravure plate making, proving, plate-mounting and proof-reading departments, receive an amount based upon the total bonus earned by the letterpress printing machine-minders. The amount allocated is divided among the various members of the departments in proportion to rates.

Clerical Staff.—A quarterly office bonus is payable, based on any saving in office costs in proportion to the total sales during the quarter. Previous records are consulted in order to decide upon the average percentage of office costs, and any saving in the actual cost compared with the estimated cost is divided equally between the company and the office staff.

Labour from Depressed Areas.—A subsistence allowance is made to juveniles brought to Birmingham, in order to bring their wages up to £1 per week to meet the cost of lodging expenses, but over a period adjustment is made to equalise gross earnings of these employees with those of labour obtained from local sources.

Paying Wages During Warnings

FROM information that we have so far been able to gather the methods of paying out wages during a warning fall under three main headings: (a) the separation of pay stations, (b) the spreading of pay hours, and (c) distribution of wage packets in the workshops and shelters.

No Long Queues Allowed

One company pays out at four pay stations, their exits are widely separated and not more than fifty employees are allowed to congregate at any station at one time. The company pays out in the shelters if employees have proceeded there. During raids, the wage envelopes are distributed in the

various shelters—the shelter system having been arranged so that each person goes into an allotted space and is easy to locate.

In another company, arrangements have been made for pay clerks to carry wage bags to the strong room, the bags being in suitable boxes which can be immediately closed and easily carried to safety.

Four companies spread pay time over the morning or afternoon, pay clerks going round the shops with the money.

Saving Time for the Job

One of the companies points out that such arrangements may be regarded as economy when a considerable amount

of overtime is being worked, since the time lost in the queue waiting for pay is company's time and can be quite considerable in amount. Also it is better that time should be lost by pay clerks than by operatives engaged on urgent production work.

Paying Near Shelters

One of these firms pays day-workers' wages at two separate times, 2 p.m. and 4 p.m. Piece-workers, who represent the majority of their employees, have their wages taken round.

One company uses the canteen for paying-out, where five lanes of people can line up for their money. It is near underground shelters.

By E. MARCUS

It is proposed to illustrate a system which is flexible, cheap to operate, and has the advantage of utilising any

As a business consultant, Mr. Marcus has achieved notable successes for firms in a wide variety of industries, and by special arrangement, BUSINESS is now able to offer readers Mr. Marcus's advice on organisational problems, free of cost. Present conditions have brought their peculiar difficulties, but whatever your organisational problem, set it down, with all the details you can, and post it to Mr. Marcus, c/o the Editor, at the address of this publication.

It will be observed that this is a plain straightforward card, which can be readily understood by every employee. The fact that it is understood by every employee will go a long way to obviate many queries after the payment of wages. There is only one unusual feature of this attendance card, and that is the deductions are across the

1. An original pay roll.
2. A duplicate pay roll, except that it is a sheet of perforated gum paper.

(Continued on page 29)

NAME _____	CLOCK NO. _____
DATE _____	WEEK NO. _____

TIME	HRS.						
+ $\frac{1}{2}$							
+ $\frac{1}{2}$							
+ 1							
TOTAL							

DEDUCTIONS:-							

NETT _____							
THUR.	FRI.	SAT.	SUN.	MON.	TUES	WED.	TOTAL

DEDUCTIONS				TOTAL	NETT		
H	U	HSA	SOCIAL				
7	9	2	2	1.8	2	7	1

T	+	1	3	+	1	8	+	1
---	---	---	---	---	---	---	---	---

Strip of deductions is taken from carbon copy of pay-roll and pasted on envelope. The simple attendance card behind succeeds because every employee understands it.

MUCH space has been given in BUSINESS, especially in the past three months, to a precise (yet simple) description of the part played by artificial lighting as a vital 'tool' of efficient production. We now, therefore, leave the subject in its broad sense and come down to the *particular*.

By this I mean the *quality* of light as a visual medium. This factor of quality is of vital importance. To have ample, well-distributed light is of course essential, but obviously a below-top result is inevitable if this light is of a nature not best suited to the human visual organ.

The perfect light is daylight: there's no argument about that. For this reason lighting engineers have constantly sought to approximate it by means of various devices.

Spectrum Does Not Make White Light

We don't want to go into technicalities, but the reason why ordinary (tungsten bulb) electric light is *not* like daylight is because it is too rich in red-yellow light rays and too poor in 'blue.' In other words, its complete spectrum does not make white light.

Early attempts to correct this were mainly in the direction of pigmenting the glass of the light bulb with a blue colour, or of otherwise passing the light through a blue filtering medium. Blue filters out the red-yellow rays but, unfortunately, allows the transmitted light to be overloaded with blue—resulting in the characteristically objectional effect on the human visual sense.

As a compromise, the use of blue-pigmented reflectors came in for attention but this also had the disadvantage of causing the typically harsh blue light, and, additional objection, the absorption by the coloured reflector of a considerable percentage of the total light output.

Since those experiments there have come into being quite new types of light sources that give a high approximation to daylight. But these involve some capital outlay, and some types, notably the fluorescent tube, are not readily available under present conditions.

What is of great interest now is the latest very successful development of the pigmented reflector. This achievement has resulted in *white* light (approximating closely to natural daylight with a touch of sunshine in it) emanating from the ordinary tungsten bulb backed by one of these reflectors.

Convert Existing Lighting

Thus, with only the addition of simple reflectors to his already existing lights the user can, with a minimum of expense and no trouble, convert his artificial lighting to 'daylight,' with all its attendant advantages of better visibility and more efficient work.

The principle of this new development is as follows: The reflector is three-ply glass. One-ply is blue, pigmented to the exact tint to absorb only the surplus red-yellow rays of the tung-

Work By DAYLIGHT At Night

More work than ever has to be done nowadays by artificial light and here is a simple way of using ordinary tungsten bulbs with three-ply glass reflectors to give a white light (similar to daylight with a touch of sunshine).

Work and workers will benefit by it.

sten light. This blue, however, is blown on to a two-ply of white crystal glass (silver-backed) in so fine a film that, while filtering the red-yellow, it has not sufficient depth to absorb any measurable amount of the total light output. In other words: while correcting ordinary electric light to near-daylight quality it does not detract from the quantity or distribution of the light.

The human eye of course is constructed to do its best work under daylight conditions. Any artificial light that can give approximately this condition therefore holds a great and obvious advantage. And if this advantage can be introduced at so low cost and with such little trouble as merely fitting simple glass reflectors then the manufacturer has got something that should really interest him.

Six Advantages

The benefits of such natural 'white' light are well known. To the operative working under it, it provides:—

1. Clearer definition of all objects looked at (i.e. better visibility)

2. Maintenance of colours in their natural values

3. General benefit to health, because eye-strain is eliminated

4. Definite increases in production because of better visibility

5. Economy of installation and maintenance, because ordinary tungsten lamps of low wattage are used

6. Definite economy in current consumption

This last item has not been stressed, but it is a fact that because of the foregoing advantages which are obtained by using mirrored glass, the best reflecting medium obtainable, definite increases in intensity are obtained. Such increases may be utilized to provide more light with the same wattage or the same intensity with less wattage.

These special reflectors are made in a wide range of varieties, from small sizes for single local light units to types for the largest general-light unit and in all styles from those suitable for the Board room, showroom or office to those for use in factories of all kinds.

Low Price Water Sterilizer

Leaves No Taste or Smell

WE have frequently stressed the need for every business, especially large manufacturing concerns, to include in their A.R.P. measures provision for on-the-spot sterilization of water.

Experience of H.E. bombs that destroy or contaminate water mains has confirmed the need for this.

Here is a low-price unit that should appeal to many A.R.P. officials. It consists of a sterilizing tank into which is placed the water to be sterilized. To this water is added the sterilizing agent and the whole is well stirred and left for 20 to 30 minutes. At the end of

this time, all harmful bacteria will have been destroyed, but the water will (or should) contain a small amount of excess chlorine, thus proving that sufficient sterilizing agent was added.

An indicator is provided which enables the user to make quite sure of this, and if necessary, further chlorine is then added. The surplus chlorine is next removed from the water by opening the tap, and allowing the water to flow by gravity into and through an activated carbon filter which not only effectively filters the water, but at the same time removes the taste and odour due to the residual chlorine.



The Company's well trained fire party is large enough to deal with fires as well as incendiaries.

How this Industrial Company's A.R.P. Plan was made Efficient

By W. GOLDING, Instructor A.R.P.S.

Successful methods used by the A.R.P. organisation of an Industrial firm employing over 3,000 men and women are described

IN such a short survey as this it is only possible to cover a few of the points which may be of use and interest to others engaged in Industrial A.R.P. Leaving aside the question of shelter accommodation, here are some of the details of organisation in an undertaking with over 3,000 employees.

All the personnel have received training in the various branches of A.R.P., including decontamination; which squads were trained according to the Government hand-book and have had the opportunity of practice with mixture G2D.

Cleansing Stations

Cleansing stations have been built on the ground floor of the factory near one entrance. There were two lavatory blocks, side by side, jutting into the open with a passage open to the air between them. They were converted to their present use by removing all toilets but two (having one remaining in the shower room and another in the dressing room). "Breeze" block partitions, covered with stucco and painted with a non-absorbent paint, formed the gas-proof divisions between the undressing, shower and dressing rooms. (See illustration below).

Each room contained the usual equipment—first-aid kit, spare clothing in the dressing room, bleach paste, brushes and towels in the shower room. Personnel were detailed as follows: one trained nurse (from welfare room), and seven attendants in each of the first-aid posts, the remaining eight women staffed the female side of the cleansing station.

Two stretcher parties were attached to each F.A.P., while another one patrolled the shelter of the factory in order to deal with any minor casualties that could be treated on the spot.

The male cleansing station staff consisted of: a man in charge, two first-aid attendants, two shower attendants, two undressers, and a clerk, the attendant staff being interchangeable.

Fire fighters, in squads of three, were given protected watching posts situated on each floor, and were made responsible for supervising some one thousand square yards of floor space. Some of these protected posts were constructed of 14 inch brick with a concrete roof and viewing slits. When the structure of the factory did not permit of a brick post, steel "Consol" shelters were used. There were two or

three watchers' posts on each floor, situated in convenient corners.

Although the factory found the "Consol" shelter would seat two men comfortably, there was not available room for three. Nevertheless, by removing the seats entirely, and by squeezing, accommodation was available for all.

Because of the flat roofs similar posts were constructed commanding points on the back and front of the building, each connected by telephone to the control room. As part of the normal fire equipment of the factory there were ample supplies of fire buckets, already installed, as well as extinguishers (soda-acid) and sprinkler valves also had been installed.

Nevertheless, as a reserve, galvanized tanks containing 150-200 gallons of water, had been placed in convenient positions on each floor and covered with a wooden lid. Supplies of sand, too, were placed at convenient intervals.

Reserve Water Essential

Additional water supplies might be taken from any of the storage tanks situated in the various parts of the factory, which altogether contained about 10,000 gallons.

Number one man of each squad was made responsible for the maintenance, replenishment, and replacement of buckets, sand containers or extinguishers in his particular patrol area.

Upon the "red" being given, the firemen in our factory have been instructed to collect their kit which they keep near by. As soon as the signal is given they go to their posts.

When the complement is complete the squad reports to the control room by 'phone. Should it become necessary to send extra help to any part of the building there is a central party stationed in the post on the ground floor, fully equipped, who may be detailed in any area which requires assistance.

The stretcher parties make for their post in the shelters, but are required to follow the last of the factory workers down the stairs. It has frequently happened that a slip on the stairs or a faint with excitement could be treated on the spot.

Messengers are stationed at the control room and each of the posts in the factory shelter, should the telephone system fail.

In this factory, equipment of the various services has been issued as

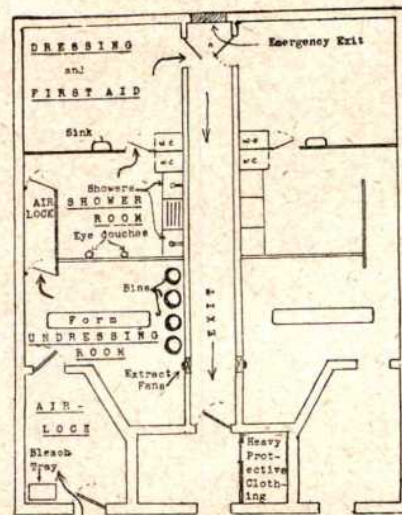
follows: fire squads, a blue dungaree overall, C.D. respirator, and eye-shield. The first man in each squad carries an axe, the third man, a torch.

Further equipment entails, in regard to the stretcher parties, that each man should carry a steel helmet, C.D. respirator, surgical haversack, water bottle and sling. Instructions have been issued that every squad should also maintain among its equipment a steel stretcher, blankets, splints, and a large haversack.

The posts themselves are large enough rooms to accommodate the personnel and several casualties. Stretchers are placed upon wooden trestles which act as couches and each stretcher, when occupied by an injured person, has an empty one standing by to replace it.

Each post has been fitted with hot and cold running water, power points for sterilisers or heaters and a telephone communicating with the control room.

Until a few months ago there was no occasion to test the efficiency of the various services, and then, one night, the building was hit by a high explosive bomb. At the time, it was usual for us to permit the general public to use the shelters at night, while we maintained a volunteer staff of A.R.P. workers on duty every night. Although the bomb demolished a staircase, and blew out a part of the wall, the only cases of casualties reported, were a few women suffering from shock.



First Aid Post and Cleansing Station. Left half for men, right half for women.

Improving A.R.P. Organisation in Factory and Office . . .

Mutual A.R.P. Schemes

This special supplement to *BUSINESS* has been prepared for us by the Editor of A.R.P. and A.F.S. Review, *The Civil Defence Journal*. Material aids to establishing an efficient A.R.P. service are given

ALL cotton manufacturing firms in the North-West area have been advised by the Cotton Spinners' and Manufacturers' Association to co-operate in a mutual support scheme to ensure the efficient use of all local A.R.P. services in the event of bombing, according to the Annual Report of the Association.

The object of this arrangement is that where a mill is bombed but the local municipality remains untouched the latter's personnel will come to the aid of the factory personnel. Should the reverse be the case the factory will give aid to the municipality.

It has been found that the roof "spotter" system was open to various objections,

particularly in the weaving industry. These objections centred around a shortage of trained spotters, the varying heights of buildings, weather conditions, and the lack of co-ordination between "spotters" on neighbouring mills.

As a result of discussions between the Association and the Regional Commissioner for the North-West, Sir Harry Haig, experiments with systems of "district spotting" have been tried by various towns.

These were based upon expert "spotters" on the outskirts being in constant touch with a central point, from which a warning could be given simultaneously to mills and other buildings in the district. The experiments are reported to contain the elements of a satisfactory solution.

the fire-watcher is set forth and answered in terse language. Hints on rescue are also a feature.

A full explanation, including its legal ramifications of the recent Civil Defence Duties under the Fire Prevention Orders is set forth in *Fire Watching*.

Aids to Spotting

IT is certain that a great number of people engaged in spotting for works, offices and large buildings in this country have received no systematic training. This state of affairs is likely to continue, chiefly on account of the volunteer basis on which it is run. Any help that can be got from books and the like is therefore to be welcomed. Mr. Chichester is as well qualified as any man to do the job and he has turned out a very handy little book (1).

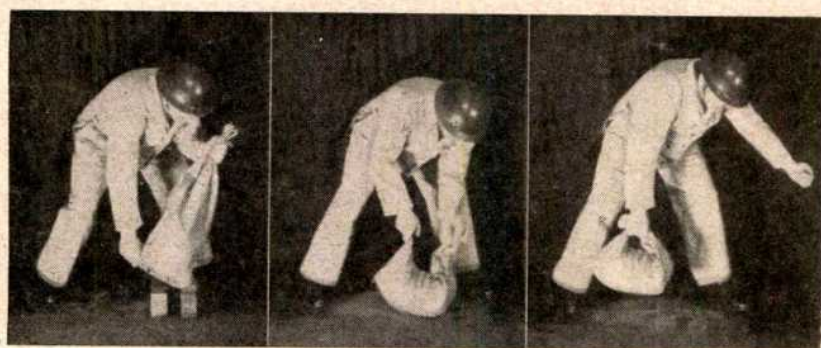
About half of it is devoted to an exposition of the officially taught WEFT analytical system of aircraft recognition. The rest of the book deals with such important incidentals as the organization, equipment and desired data of spotters in general; and to the incidental arts of spotting on which he bases his all important estimates of what is likely to happen next.

More attention might be paid to the use of acoustic devices for spotters for this winter and night bombing have brought home to us the limitations of purely visual means. The importance of listening is implicitly recognised by the *Observer Corps* with their "Hearer's Clubs." News of these is obtainable from the *Aeroplane's* new weekly offspring, the *Spotter* (2), produced with all the technical competence of the parent paper. It is a valuable means of keeping refreshed and up to date.

A further book (3), gives more detailed information—it is attractive and well illustrated, contains photographs, scale diagrams and full structural and descriptive details of 87 different aircraft, among which are represented those of Great Britain, Germany, Italy, France, Poland, Holland, Belgium and U.S.A. in that order. In some cases double—and even treble—page plans are provided and views from four different angles are given in each instance.

Because of the clarity and size of the photographs distinctive details can be easily picked out if and when the planes are actually seen.

- (1) *The Spotter's Handbook*. Francis Chichester. Allen and Unwin. 1941. 5/-.
- (2) *The Aeroplane Spotter*. Temple Press. 3d. weekly.
- (3) *Aircraft of the Fighting Powers*. D. A. Russell. Harborough Publishing Company. 1941. 12d.



How to use a Sandbag on a Fire Bomb.
In this illustration, taken from an excellent leaflet entitled "*How to Smother a Fire Bomb*,"* a method of grasping the sandbag in one hand is shown. The sandbag can be controlled more easily by this method.

Blasts on Whistles Now Mean Fires

THE scheme whereby wardens in the London Metropolitan police district now blow their whistles only to indicate that fire bombs are being dropped in the area has been extended to the rest of the country.

This order is the result of a change of policy on the part of the Ministry of Home Security. Previously whistles were blown to indicate imminent danger.

The order applies throughout the day and night, and the blasts of the whistle are short and sharp. Long blasts will only be blown to reinforce or replace the siren signal.

The Ministry of Home Security, in

advice to civilians as to what to do when the air-raid sirens sound, says:

"As the warning is now treated as an 'Alert' only it is open to any pedestrian to go on his way, but he should be prepared to take cover if he hears guns or bombs or enemy aircraft.

"When there is reason to think the enemy is near it is the duty of all civilians to avoid taking risks, not only for their own sakes, but also for the sake of the Civil Defence Services, who will be called to look after them if they are injured."

Fire Fighting Books

- (1) *The Fire Parties' Hand Book*. Jordan and Sons, Ltd. 16 pages. 6d.
- (2) *Fire Watching*, by John Burke. Hamish Hamilton, Ltd. 16 pages. 6d.

A WELL illustrated summary of fire-watching duties is contained in the *Fire Parties' Handbook*.

Every problem that is likely to confront

*This leaflet contains many very instructive ideas, ingeniously illustrated. A copy will be sent free to responsible executives who send a stamped addressed envelope to the publishers, "The Gordon Press," 10 St. Bride's Street, E.C.4.

Handling Office Supplies Like Cash

How The System of Having Every Department "Pay" for Its Supplies Works Out

THESE are days when business employs small economies, although on the other hand economy in small items must not be carried to the extreme of disregard of economy in time and convenience. And a watching system as well is worth while to avoid such cases as that of a clerk in whose desk the head of a small business recently found a six months' supply of his "A" grade stationery, pen points enough for half the office staff, a drawer full of assorted scratch pads, and four boxes of rubber bands which were brittle with age.

What are the objectives of an office-supplies economy campaign?

- (1) Consumption of fewer supplies through economy in use and prevention of waste.
- (2) Prevention of over-stocking of any items.
- (3) Prevention of obsolescence and spoilage through time-lapse.
- (4) Reduction in total stock and in money tied up therein.
- (5) Prevention on the other hand of shortage and consequent inconvenience and extra expense.
- (6) Utilization of hitherto waste products.

Finding a Method of Control

Either carelessness or too much red tape in giving out supplies is likely to result in overstock and waste at the individual desks. Office supplies deserve records and safeguards as accurate and as simple as accounts and cash. To make sure on this point is one of the first moves in putting office expenses where they belong. It is simple enough in the concern where a trained stores clerk can give all his time to the work; but some of the methods worked out by smaller offices, where the keeper of stock has a half dozen other duties in the way of manifolded, buying, despatching, indicate the direction for better control even where the stock-room is merely a desk drawer and a shelf in a cupboard.

One of the most perplexing problems in every business house is to find a proper method for keeping track of printed forms, different kinds of stationery, and other small office supplies. An inventory system becomes a great saving in the case of expensive supplies; and even in small articles such as pins, pencils, rubber bands, and the hundred other articles that every office requires, economies may be brought about that are well worth considering.

One manager, after experiencing the annoyance of finding lost stocks after

purchasing a new lot, evolved a stock-keeping plan that suits the small office.

He had a closed stationery cupboard constructed under a stairway, consisting of a series of shelves of uniform size, divided by upright partitions spaced to suit the various items. The spaces between these uprights may be either lettered or numbered. Cards were printed for the use of the stationery clerk, and placed in alphabetical order in a loose-leaf card tray. As printed matter is received from the printer, it is turned over to the stationery clerk, who enters the name or number of the form on the card. He then re-wraps the job in smaller packages, 50 to 100 copies in each package, and numbers them. These are then placed, the smallest package numbers at the back and bottom, in the proper compartment of the stationery closet.

On the back of each supply card the minimum and maximum to be kept in stock may be noted. As the stationery clerk receives requisitions for the various forms he fills them with the numbered packages, noting on the card the data from these requisitions. Packages are wrapped to contain the most convenient quantity. Blanks or forms of which a large number are used in a short time, are wrapped in larger packages than others.

A skilful clerk will find many advantages in this plan. As he re-wraps he counts one package in five or ten as a check on the supplier. By going over his card record for the past year or more, he learns what quantity to order to last a certain time.

Working with the office manager, he can keep down the amount of money tied up in forms which are likely to change and place orders which will secure all the advantages of price on standard items. Whenever he wishes to verify his running inventory, he has only to count the wrapped packages and the one broken package. To arrange his piles in tens, makes it easier, and he is thus enabled to check on any unauthorized disturbance of the stock. During any absence, he can leave the key with the head of the office, assured that his card index will enable the manager to find any item in case of emergency.

Stationery Supplies on "Credit"

Even in offices of large size, one of the greatest sources of losses often is the matter of storing and distributing supplies. In remedying this difficulty, one office head adopted the standard stores system in use in factories operating under scientific management methods.

He gathered all supplies into a general storeroom and put a man in charge. Each item was charged up against that department and totalled each month for comparison with records of other months and other sections. In effect, the storeroom was a business, retailing supplies on credit to the various departments.

Re-organization of stores was carried still further, however. Instead of ranging shelves about the walls, they were carried up in uniform stacks with roomy aisles between. Stores were classified and sections assigned to them. Sections were subdivided into units large enough to hold the maximum supply of each item yet not waste space. Pencils, papers, forms, clips and so on, were kept in their original packages.

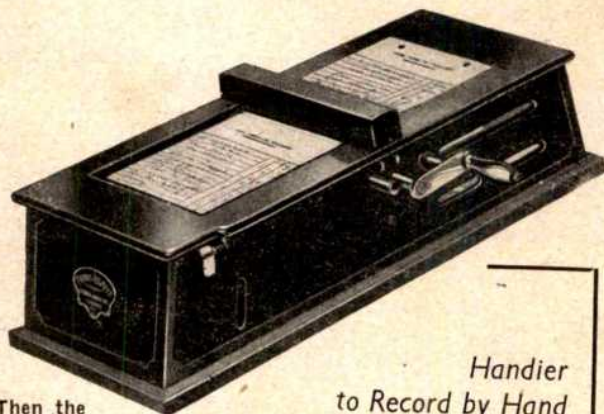
The Balance of Stores Clerk

To insure a proper balance of supplies a "balance-of-stores" clerk was installed. Loose-leaf books were provided for "Office Supplies and Other Price Stores," "Unpriced Stores" and "Unclassified Stores." In one or another of these books every item in stock had its individual sheet. Nothing entered or issued from the storeroom without a "stores-received" or "stores issued" slip being sent to the clerk. From this slip entry was made in the proper book, in order to show at any time the quantity on hand. The maximum and minimum supplies were all set down. When the supply dropped to the latter point the clerk notified the purchasing agent to order more.

Wherever the spirit of the organization is loyal, any plan which enables each employee to see what supplies cost the firm results in a worth-while economy. At the outbreak of war one progressive office curbed its expense for supplies by allowing each department a certain weekly appropriation for such purchases, equivalent to 66 2/3% of the previous year. Aluminium coins, good at the supply window for threepence, sixpence, one shilling and five shillings, are issued to each department head on the first of each month, equivalent to 66 2/3% of previous consumption. No material is issued to a department except for strictly "cash" payment. A bonus is paid to each department in the form of a commission on all such "money" remaining unspent. So pronounced is the disinclination to part with cash, that the result is a marked economy in most departments; to such a degree in fact that the percentage has now been cut down to below 50% of past consumption.

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How to be Personally More Efficient

TO-DAY every executive finds that he, personally, must tackle many more jobs than formerly came within his daily routine. He finds his work more "cut up" and he is often compelled to jump from one important thing to another at very short notice.

This sort of shuffle-about rattles many people, puts them off their stroke and prevents them giving their best to any of the things that clamours for careful attention and decision.

How does the successful executive handle this sort of situation, and what advice, if any, can be offered to the man who is bothered with this confusing pressure of affairs?

In order to try to find out we interviewed an executive whom we know well as an exceptionally experienced and able man; and we also consulted a practising psychologist. Here is a summary of the two contributions to the subject.

The business executive, like many a successful man, could not at first outline anything definite about his methods. His efforts were instinctive, subconscious, he wasn't really aware of them, so we had to dig carefully by means of simple but very close questioning.

In the end it became absolutely clear that, whether he realised it or not, this man worked on a very definite basis. He challenged everything that came up for attention with the question: "How important is it?" By that he also meant "how *urgent* is it?"

Select—and then Concentrate

He possessed the faculty of very accurately assessing these values, and when he selected a thing on the basis of this valuation he simply blanked his mind to all else and bent his energy, skill and speed to accomplishing that job. It may be a little job or a big job, it makes no matter, he just does *that* job.

A one-track mind? Certainly not: don't ever confuse that sort of faculty with the so-called one-track mind. If you want a good description of this latter affliction Emerson gives it in his phrase: "A foolish consistency is the bugbear of the narrow mind." A different thing altogether.

In the last war the "foolish consistency" used to cost us a hundred thousand casualties a day, with results in inverse proportion.

No, the ability calmly to sort out a jumble of matters into their degrees of importance and then to deal *clearly*,

Most executives now have to handle more jobs in less time than formerly. How can it be done? It's not easy, but here are some hints that will help

From an Interview with a Successful Executive, and a Practising Psychologist

effectively and speedily with each in its proper order is an extremely valuable type of mind. It is the type of mind that not only gets things done but which also maintains equanimity of temperament and well-being of the body. Why? Because such a man is the master of his nerves, not the harassed servant of them.

Well, there was little else to be got out of that executive. He just did his job that way. All very simple, isn't it? That is one of the hallmarks of the really efficient man. Everything he does looks so easy.

Know You Can Do It!

Now what does the psychologist say? "The majority of failures in life may be attributed to want of confidence, to procrastination and to a lack of concentration and order."

We quote verbatim most of this man's phrases because he put them so well.

"To do a job, any job, properly it is absolutely essential (a) to *know*, deep down within yourself that you *can* do it, (this is specially valuable to young executives) and (b) then to devote your whole energy to doing it. You cannot bend this whole energy unless you debar all else from the mind at the moment. In other words, you must *concentrate*.

"How can one concentrate? Concentration is a movement of the attention within a circle of ideas related to the main idea: the idea of the job to be done.

"Think of it this way. Imagine a circle, this represents all the various ideas which can be brought to bear on the main idea. Let the main idea represent a point at the centre of the circle. The problem is how to bring all the lines of thought from the circumference to the central point. When this is solved, concentration is achieved.

"That may sound a bit crude and not very helpful. Nothing in it you'll say. But on the contrary there is a very great deal in it. Not everything of

course, because real concentration is more complex than that. But it is a thoroughly good working tool.

"Now when jobs come up, select the one you will do first then use your imagination. Visualise it at the centre of that circle and concentrate your mind's eye bang on it. Don't be put off. If you find creeping into the circle the fear or the thought about some other job equally urgent, that you are allowing to wait while you do this present job, *shut out that thought*: shut is out by bending all your conscious thought into the centre of the circle that you can see there plainly with the mind's eye. Let all else go to hell if you like to put it that way. But think so hard of the job right there in the centre of the circle that side-tracking thoughts just cannot get in; and they *can't* get in if your mind is fully occupied. Refuse absolutely to wander or be side-tracked by the pull of other jobs. You'll be sunk if you allow that to happen.

Be Boss Of Your Thoughts

"Of course it *will* happen at first; you haven't got the technique for stopping it. All this free play of haphazard thoughts has been your master up till now: it will take some time to assert your rightful place as boss. But you can do it; and that, roughly, is the way to go about it.

"You will work faster and get more positive work done by thus doing one job at a time, and doing it properly, than by any amount of haphazard stabbing first at one thing then at another.

"There's no easy, free-of-trouble method of rebuilding a comparatively undisciplined mind into an orderly, smooth-working efficient mind. There's no lamp-rubbing to make the genie appear. Training the mind to work is hard going. It takes practice—a lot of it. But believe me, there's nothing more sure than that any *normally* constituted person can build his mind

(Continued on page 32)

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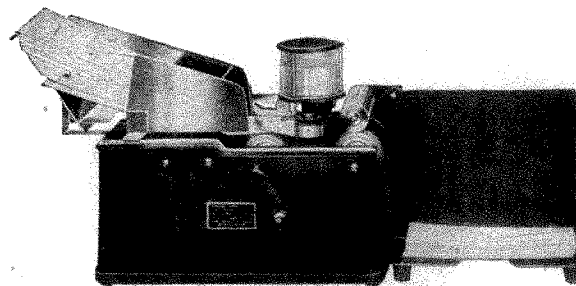
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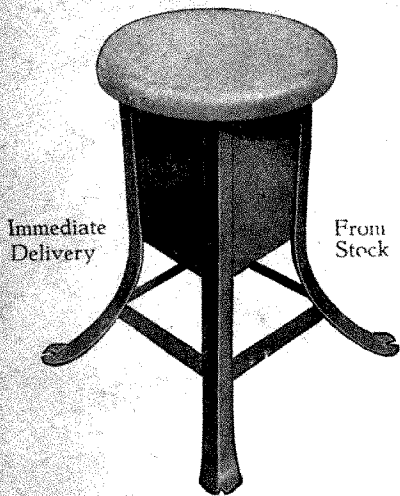
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Selecting a War-Time Budget Controller

(Continued from page 13)

20th of the month (why not indicate a new approach to debtors instead of the old stereotyped letters?); he may remind the buyer that the ratio of raw material to finished goods is too high (why not institute a system for the buyer?); he may indicate to the works manager that the work-in-progress cannot satisfy the increased demands (why not have a recognized hour each day to show him your methods of achieving control?); he may suggest to the sales manager that too many of grade "A" products are being sold compared with grade "B" (why not show him your instructive graphs?); and all these men have to be approached in *their* way—not that of the budget controller. Reminding is not enough. He must be forceful enough to find out definite reasons for failure to keep to the budget standard, and to act on the information obtained. The whole cash position may be jeopardised, especially in a rapidly expanding business, if budgets are set and no check-up is made till the end of the month's figures are out.

A bending of one's personality to the accountant, buyer, works-manager and sales-manager is not easy but it is the only way to *get things done at the proper time and at the proper costs*—and that is why a budget is compiled and should be controlled.

Government Wants Those Idle Office Machines

Office machines of all kinds—typewriters, adding and calculating machines, etc.—are urgently needed by the Government. To import these machines means using up valuable shipping space. If, therefore, you have any such machines not now being used, H.M. Government would be glad to have offers to sell, hire or lend. Offers should be addressed to: — H.M. STATIONERY OFFICE, SUPPLIES DIVISION (S3.), PRINCES STREET, LONDON, S.W.1.

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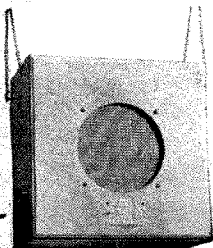
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That Growing PAY ROLL

(Continued from page 20)

A convenient number of perforations per page is in the region of twenty, as beyond this number the sheet is cumbersome to handle, and there is a likelihood of the copy slipping.

As the saving of stationery in war time is of paramount importance, the top copy could be printed both sides in tumbler fashion, thereby saving one sheet of paper. The pay roll should be copied from the attendance cards and the gummed perforated sheet is then torn into strips along the perforations and each strip stuck on to a transparent wages envelope.

At this point another saving will be effected, as the transparent wages envelope does not require to be printed. Juniors can do the sticking: and provided that they do not lose a strip, they cannot go wrong.

The method of placing the strip on the envelope is rather unusual: it is as follows: The amount of nett wages should be so placed that when the envelope is sealed, the flap seals over the nett amount and increases the difficulty of defalcation.

This system is flexible to a degree. Should another hundred or so employees be engaged at any time the additional writing up of the pay roll merely means that one of the girls in the invoicing section, who has an hour to spare, helps on the pay roll.

Since no mistakes can occur in the writing of the pay roll envelopes, considerable time is saved both in the physical effort of writing, and in the time lost in finding an error due to faulty copying. As a result employees are paid on time, and they have every piece of information on their pay packet to show how it is made up. They like the system.

Why not try this method of doing your pay roll for a month?



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From 6s
softest to
9s, hardest

Preparing Post-War Business NOW!

(Continued from page 18)

are immediately available that show: sources of supply, full details of suppliers, prices and price trends, whether we are already using it, any particular snags about it, notes about materials that could be used as substitutes, etc., and so on.

If it is suggested that we take up, say a new rat trap, available statistics at once tell us how many rat traps per year are already sold, what firms make them, where the biggest sales are, prices, discounts, what advertising is done, who does it, and so on and so on. The statistics tell us *all* about the rat trap business. We can weigh up the situation on the spot.

We might want to know what proportion of, say, motor boats are fitted with outboard motors and what proportion with in-board engines (a) petrol (b) oil. We can tell in a few minutes.

The question might arise: what is the trade in this country for private electric lighting sets? We can tell total volume; what firms share that total, and to what extent each; what they pay their salesmen; how many types and kinds of sets they make; who buys them; etc., etc.

Information Must Be Instantly Available

But to amass information of this kind would be of no use whatever if we could not find it when we want it. We therefore use the machine punched card system of analysis. It is unnecessary to describe this to readers of *BUSINESS*. The enormous number of classifications that can be maintained and automatically selected at high speed when required is of course understood by all progressive executives.

Vitally Important: Retaining Trained Sales Force

In a company dealing with technical and scientific products the importance of having a carefully trained selling force of able men will be appreciated. Inevitably many of our trained salesmen have gone into the Forces, but we shall want them after the war. Before each man left, therefore, he was given a guarantee that, on his demobilization, he would either be given back his old job, or be assured of similar employment for a minimum of three months while adjustments are made. The latter qualification was inserted as an obvious safeguard to the company while at the same time affording a concrete offer to the salesmen.

We sincerely hope to see the great majority of our men back again as, by planning for the future, we already have a heavy and attractive programme of post war business.

THE War Damage Act, 1941

vitally affects every business in the United Kingdom. It is essential to have available the actual text of the Act. But the Act by itself is of little use without the Rules and Orders made under it and it is only the latest of a series of Acts which deal with the effect of war damage on the rights of property owners.

THE LOOSE-LEAF ENCYCLOPÆDIA OF WAR DAMAGE AND COMPENSATION

Edited by **JOHN BURKE**,
Barrister-at-Law.

Editor "Loose-Leaf War Legislation."
Assistant Managing Editor "Halsbury's
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Speeding Up The Mail

Where do delays occur? In order to act on the Post Office slogan, "Post Early!" it is necessary to deal quickly with all deliveries of incoming mail as well as speeding up out-going correspondence

IN pretty well every business it was always a fact that to speed up the handling of the mail (both "in" and "out" mail) meant that you helped to speed up the tempo of the whole day's business.

In peace time the Post Office worked fast, and delays (if any) in the passage of business correspondence were due almost wholly to dilatoriness on the part of executives and staffs of the firms concerned.

To-day, as we all know, the Post Office cannot guarantee speed. It is therefore more than ever up to business executives and their staffs to put all the speed they can into the handling of mail within their own offices.

The Post Office constantly plugs its S.O.S. injunction to "Post Early—Before Noon." But from the business point of view it is not enough merely to post early in the day. You've got to inject the speed right from the point at which the *in-coming* letter arrives. At the earliest possible moment that letter must be routed to the man it is intended for, so that he can get action on it. The necessary action must then be prompt—all the way through to the stamping or franking of the finally sealed envelope containing the reply. With all that attended to *then* you can ensure that the "post early" part of the routine is properly observed.

Watch the Second Delivery

One of the greatest causes of delayed correspondence to-day is the slow initial routing of the in-coming letters. Late though it often is in arriving the first delivery of the day generally gets distributed promptly. Often executives are in their offices before the postman arrives so they are on hand to exercise plenty of pressure to get their first mail

the moment it does come in. But because of the almost total disappearance of internal messenger services later postal deliveries are frequently neglected. In my visits to firms in all parts of the country I have been amazed at the number of times I have seen letters lying about at reception counters because no messenger is available to take them to somebody who can get action on them.

I am certain that, because of the frequently changing nature of staffs these days, not sufficient trouble is taken by managements to *fix responsibility* on some person (preferably *not* an inexperienced junior) to watch over the incoming mail. If the clerk appointed for this duty leaves within a few weeks then saddle somebody else with the responsibility: see that this is never neglected.

We are all a bit too much inclined to use the war as an excuse for our shortcomings, and particularly in regard to our delays in dealing with correspondence. It's a quite safe excuse; the correspondent cannot check up on us. But bad as it is, the war isn't responsible for everything.

In these times it is probably impossible to find any system of office routine working at full efficiency. But at one firm that I visited recently I did find this matter of correspondence reasonably well dealt with.

Make One Person Responsible

A woman clerk in the accounts department was given the extra responsibility of supervising the incoming mail. She was "de-centralised" from her department (the nature of her work was adjusted to allow of this) and accommodated with a desk and all necessary equipment for her work in a corner behind the reception counter on

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the ground floor of the offices.

In the morning she (with the reception clerk's assistance) opens the first delivery. She then acts as messenger and delivers the opened letters to the appropriate executives. That looks after the first delivery, but her special value operates to greater effect during the rest of the day.

The moment subsequent deliveries are made, no matter whether they are postal or hand deliveries, this clerk personally takes them immediately to the persons for whom they are intended. In this way on many and many an occasion, I was told, it has been possible to get action that day on a valuable order when otherwise a loss of probably 24 hours might have occurred.

If anyone, therefore, feels inclined to criticise this arrangement of interrupting the work of a responsible clerk merely to act as distributor of correspondence let him first take into consideration the potential value of the girl in this capacity.

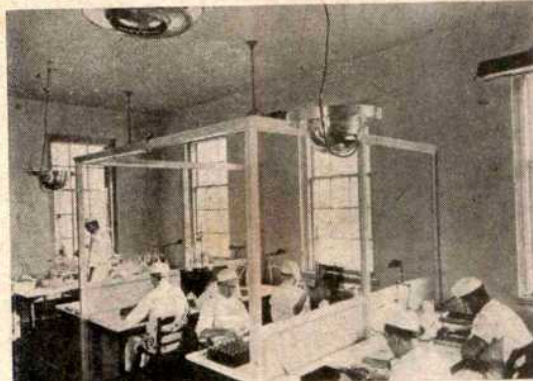
At a time when all too often customers suffer annoying delays and when it is fatally easy to lose the goodwill that one's company has taken years to build up, surely an unorthodox arrangement that very much reduces



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(Continued on page 32)

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(Below) Air Sanitizers operating in a pharmaceutical laboratory.

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Speeding Up The Mail

(Continued from page 31)

these undesirable factors is well worth while. If the contented feeling and goodwill of only one good customer (though of course the more the better) is solidly retained, then the slight extra expense is more than offset.

Dictate Early—Sign Early— Post Early!

And of course the lessened strain and worry on executives and their departments which results from the prompt and accurate distribution of mail must also be counted as a worth-while achievement and as an asset that further offsets the cost.

It is not suggested that every firm can put into operation exactly such a plan as this, but the situation certainly needs *something* to be done about it.

So much for incoming mail. Obviously, the foregoing speed-up would lose much of its value if similar pressure was not put on the handling of out-going letters.

It is a rule of the company that executives *must* deal with letters as soon after receipt as possible. Dictation must be given early in the morning so that replies can be signed, sealed and posted before noon.

Another rule is that secretaries and typists of all executives must by 11.45, deliver to the front counter all the letters they can possibly get their chiefs to finish. These are then stamped and posted.

Now it is no good merely considering this "post early" injunction as just a slogan. Positive and continuous action must be put behind it by all executives and by the management itself other-

wise, like many other worthy aims, it will be in danger of petering out after a while.

Posting before noon enables out-of-town letters to get to their destinations by the first delivery next morning. This in itself is a great speed-up of business in present-time conditions and is well worth while going to a little trouble to achieve.

How to be Personally More Efficient

(Continued from page 26)

into a vastly improved executive force.

"In thinking about this matter of concentration on single jobs don't be under any delusion that it immobilises the mind; under proper control, the mind remains beautifully agile from an executive point of view.

This Is Not Theory—It Works In Practice

"For example, think of a managing director concentrating on an important matter concerning which he has to make a decision within a few hours. If a subordinate executive breaks in on him with another important matter that must have official O.K. within thirty minutes that managing directors' mind will (or should) perceive at once the priority of the new matter. He will blank from his mind the first problem and will bend the whole power of his faculties to the new one. In a few minutes' full power mental attack he will dispose of it completely, dismiss it from his thoughts and re-engage with the original problem as though he had never left it. That's not mere theory it's efficient practice. That is how successful executives get through so much work effectively: effectively is the operative word."

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The Psychologist Supports The Business Man

So there you are. The psychologist independently confirms as a first essential that quality by means of which the executive of our first interview had (almost unwittingly) for years been building himself into a success.

And it's pretty obvious when you come to think of it that a job will be far better and more quickly done when the full, undiluted mental faculties are brought to bear on it than when only a hesitant fraction of those powers dithers about on it.

If ever there was a time when clear unclouded thinking and "doing" was of first importance it is now. In fact the only way to handle successfully the more "cut up" and diverse character of work to-day is by this method of marshalling the faculties under control instead of allowing them to be badgered about by circumstances: of concentrating them on to jobs instead of allowing a diversity of jobs to stampede them into dithering inefficiency—for, bluntly, that is what it is.

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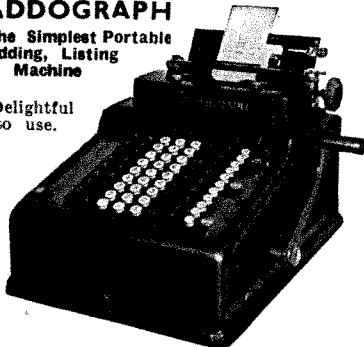
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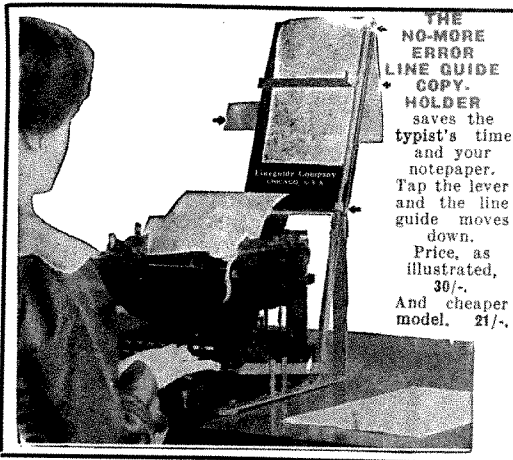
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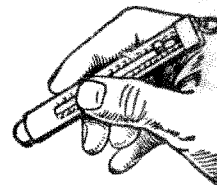


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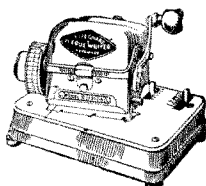
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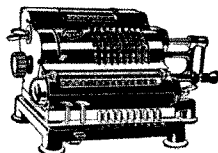
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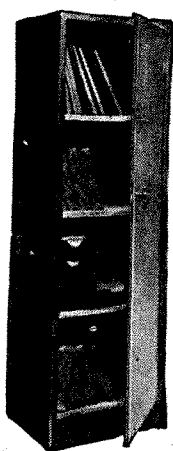
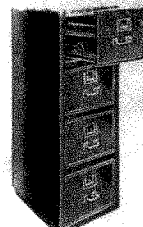
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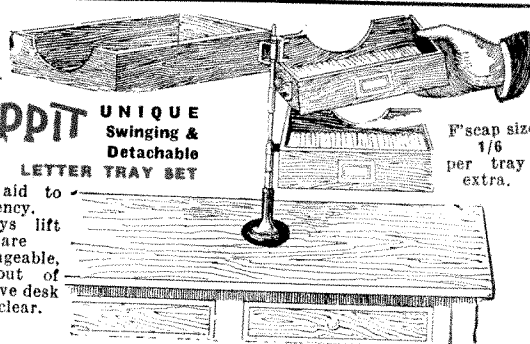
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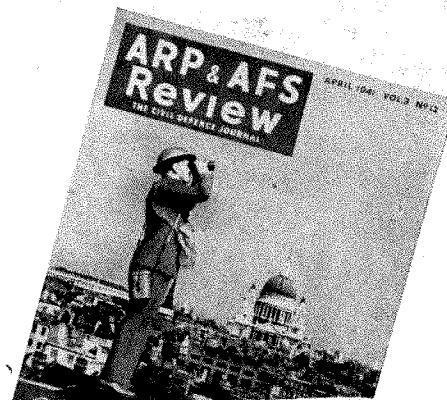
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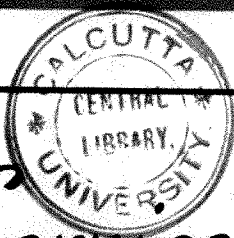


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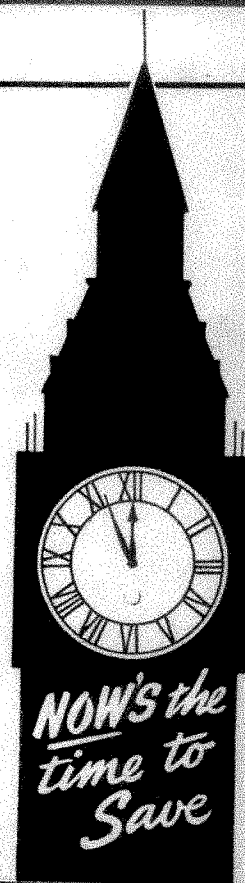
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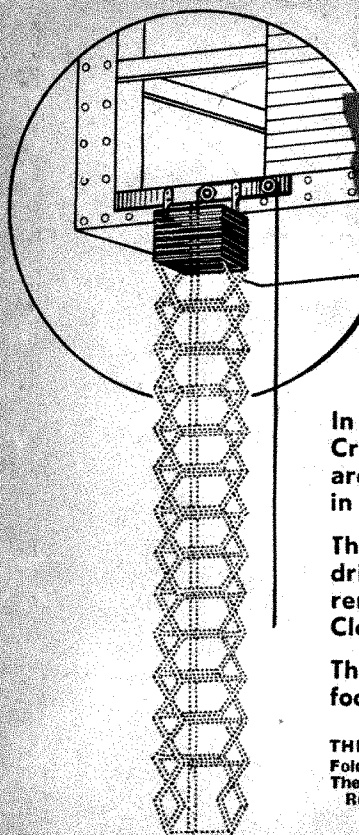
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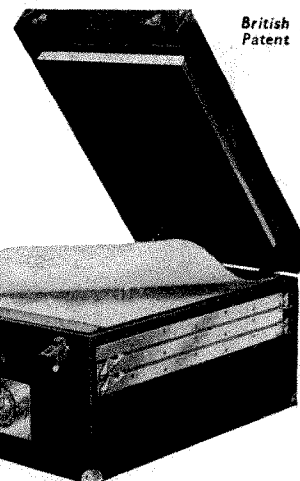
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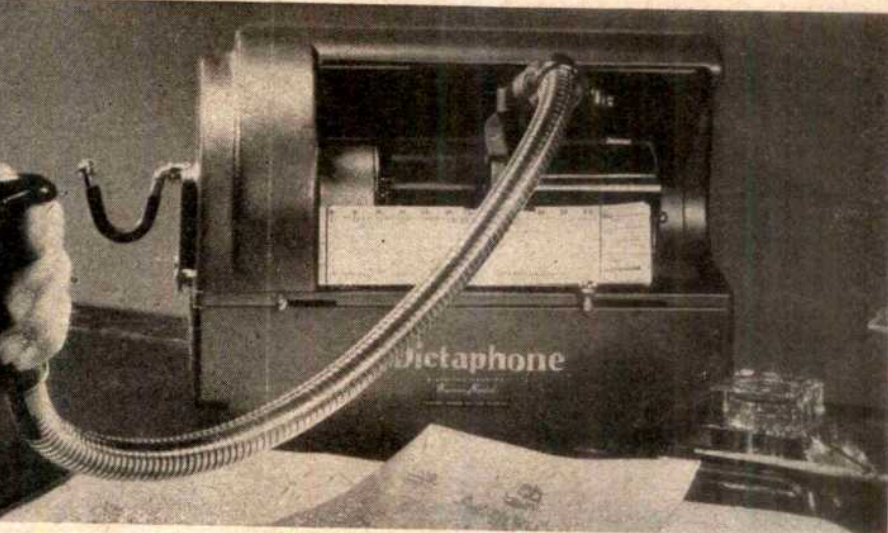


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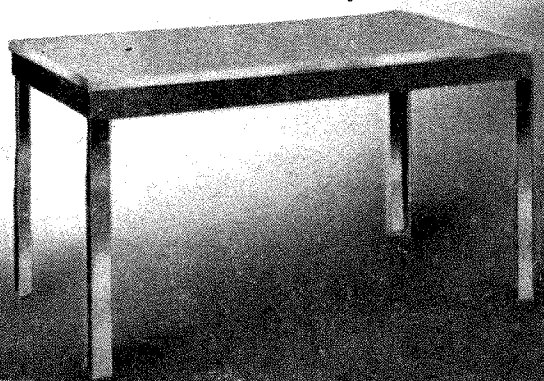
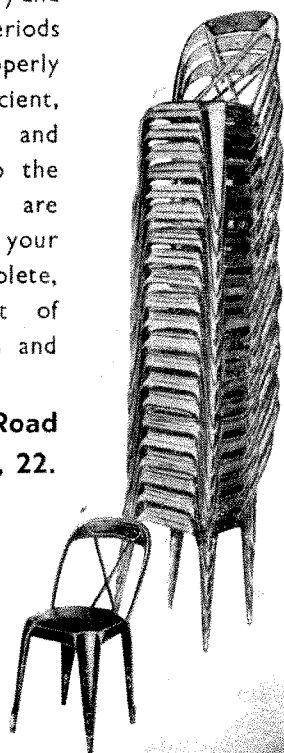
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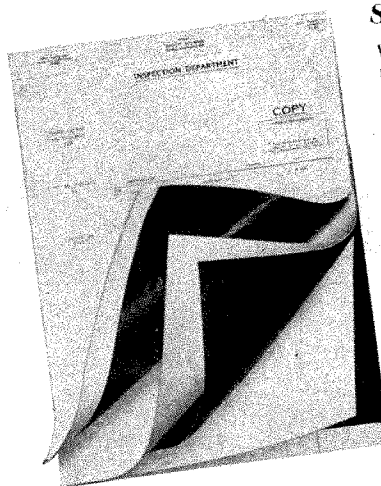
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PREPARE NOW TO EMPLOY MORE & MORE WOMEN



"Look constantly to women for your new recruits; they are excellently suited to many types of work. Hundreds of thousands must enter war production this year and every factory must play its part."

This is Point No. 3 of the Ministry of Labour's "4-POINT PLAN TO INCREASE WAR PRODUCTION" addressed to management.

THE OTHER 3 POINTS IN THE PLAN ARE:—

POINT No. 1. Skilled men are needed for the really skilled jobs. Be sure that each of your men is employed up to the very limit of his skill. Combat skilled labour shortage by breaking down processes wherever you can, and by training up your workpeople, both men and women, to jobs of greater skill.

POINT No. 2. Training Schemes must be developed to the greatest possible extent. Take in more new workers for training on the job in your own works. Remember that the Government will help you with semi-skilled men and women trained under official schemes.

POINT No. 4. Efficient Personnel Management is essential. Remember that you must secure the whole-hearted co-operation of your workpeople. Look closely to their welfare. Many of them may be new to industry; be patient and help them all you can during the first difficult weeks. A little foresight will reduce your labour turnover.

HERE ARE JUST A FEW TYPES OF ENGINEERING WORK WHICH WOMEN ARE NOW DOING IN WAR FACTORIES

1. Operating on Hald Internal Grinders, on which the sleeve valves of aero engines are internally ground to a tolerance of $\frac{2}{1000}$ ths of an inch. Operating of thread grinding machines to similar limits.
2. Pneumatic riveting of main spars of aircraft and de Bergue riveting of exhaust manifolds.
3. Welding steel fabricated plate in thicknesses of $\frac{1}{8}$ in. to $1\frac{1}{2}$ in. Boring

- tubes of 17 ins. to 20 ins. diameter, up to 48 in. long on special machines.
4. Working heavy machine tools in all operations—except roughing—in production of 25 lb. shells.
5. Operating on 16' long gun barrel boring lathes and large surface grinding machines.
6. Milling gun parts to limits of $\frac{1}{1000}$ th of an inch—and grinding them to limits of $\frac{1}{1000}$ th of an inch on Brown & Sharpe machines.

7. Grinding, including pivoting, external grinding and gear hobbing on Mikron machines.
8. Working on radial drilling machines up to 6 ft. 6 ins. where they do their own setting up and use no jigs.
9. Optical grinding and polishing to extremely fine limits.
10. Capstan setting, internal and external grinding, grinding screw gauges and inspecting them.

REMEMBER! if you have not yet received your copy of "THE EMPLOYMENT OF WOMEN . . . SUGGESTIONS TO EMPLOYERS" instruct your secretary to write for one to-day, asking for pamphlet 87/1941 to the Manager of the nearest office of the Ministry of Labour and National Service.

MOBILISE FOR





Making the Job Easy for the Bevin Girl

To help their women employees (chiefly unskilled) a leading motor manufacturing firm have made use of many 'last word' and some ENTIRELY NEW devices.

Jigs and drills coloured to indicate correct size of drill to use. Elaborate jobs split up into half-a-dozen simple operations. Skilled men from the shops promoted to the tool room. These are only three of many effective methods now solving some of the difficulties.

Three production and planning managers collaborated in making this description of the firm's war-time practice helpful to YOU.

By Cecil Chisholm

CLEARLY one of the most urgent jobs facing every manufacturing concern to-day is the finding, training and effective use of unskilled women workers. For we are still badly behind in this matter.

Happily the Ministry of Labour's energetic advertising has been successful where other means have failed. Bevin girls are at last coming forward in appreciable numbers. As the concentration of industry gets going, the present steady stream will become a flood. (Incidentally, it is important to plan and prepare now against being engulfed when these unskilled workers walk into the works).

Outside mining, ship-building and a few other heavy industries, this is almost every employer's job. The pity is that the Ministry of Labour failed to get busy on it much earlier and much more energetically.

Diluting Industry with Unskilled Women

Consider the size of the problem. The engineering industries have to absorb 750,000 women in the next five months. On the average, an establishment must reduce its skilled labour to 30 per cent. from an average of 40 per cent. of the force, and normally 30 per

cent. of the workers must be women. In very many instances women now represent only 5-10 per cent. of the force.

Of course, there is nothing new to the average engineering concern in the methods to be employed. Many of them are in use already. It is rather a case of spreading their use more widely through the factory.

Some employers are inclined to ask why they should be disturbed if they have adequate skilled and semi-skilled labour for all their work. Why should they lose the fruits of decades of training and careful management to somebody else who has been less far sighted and conscientious?

The answer is that new factories, already equipped with machinery and tools for war work are without labour for drawing-office, tool room, bench or automatic. Other new factories are nearly finished and will require the same complete force of skilled, semi-skilled and unskilled labour. So every employer and manager has to get down to the problem of reducing both skilled

and semi-skilled men by using a great number of unskilled men and women.

The technique consists simply in extending the

- (a) Breaking-up and simplifying of intricate operations so that an unskilled girl can tackle one of the resultant jobs successfully.
- (b) Training of women in some of the rudiments of production work for more complicated jobs.
- (c) Promotion of semi-skilled workers to the tool room or other highly skilled work.

The industry to which the change will come most easily is the motor trade. For most motor concerns have always used the maximum amount of repetition work. They have always simplified their work to suit unskilled operators, and have had a very complete training in the whole business during the last war, when Lord Austin and others pioneered the mass produc-

tion of munitions by unskilled workers. Some factories I found have already many hundreds of women at work. So many women, indeed, that it has been found unnecessary to operate a special training school. The managers find that with a large number of women at work the new girl learns more quickly than if she is alone. Further, processes are being sold greatly simplified to suit the Bevin girl and the training period is only a matter of a week or two.

Maintaining the Interest of the Learner

On joining up, the new girl over 21 is paid at a flat rate of wages for the training period until a certain degree of proficiency is shown, when she is paid the same rate plus a bonus based on relatively low output. This method of payment is continued until it is possible to set a piece-work rate for women on the job concerned.

This scheme keeps up the interest of the learner. It avoids any long period at time rates by introducing an intermediate stage when an extra effort will bring a little extra money. It is one of the most ingenious ways of sustaining the new girl's interest that I have yet met with.

The engineers have spared no trouble to split the most intricate jobs into a large number of simple operations. I watched the production, for instance, of an intricately machined part formerly done by a few semi-skilled men; 90 per cent. of the work is now done by women.

The only part done by men is the routing out of the body by automatics. This is naturally heavier work demanding considerable skill. When this is done the second stage, inspection, is taken over by women. But the girls use simple gauges which are checked weekly, thus eliminating the skill required in using micrometers. The next process involves the very simple use of a double action drill across the part and is easily done by a girl. The fourth process is the drilling of a single hole through both outer walls of

the part, again an ideally simple action. The fifth consists of easing external and internal threads, the sixth of inspecting the metal wall of the part by a modern micrometer. This is made easier by the use of a clock-faced instrument. In this way, five-sixths of the work on this part is done by women. Incidentally, they are not using expensive machines.

Division of Operations Eliminates Intricate Work

Even in engineering, one occasionally comes across processes which are ideal for female labour. One of these is the lining of civilian helmets. Even here the processes have been broken-up to the utmost, one girl folding and gumming the lining, a second cutting it and a third adding the cross straps. The relatively large machines used for cutting complete lengths of material into the necessary 24 narrow straps is also done by women. In fact 90 per cent. of this work is done by Bevin girls.

At the other end of the school one or two women have learned the difficult and arduous job of welding at one of the leading works in the country. This is the one process for which a small training shop has been set up. This was opened a year ago and already a number of men and several girls have passed the necessary test.

Another job I was surprised to find women doing was cable splicing. This requires a considerable strength of wrist and delicacy of touch. In this case it has been found that women do the job better than men. In this process the worker puts the wire into the vice and pulls it to make a splice.

There are other jobs which while involving a simple process such as drilling or cutting involves work on a large part of the finished article. This means that the unskilled worker must be provided with a large special jig, designed to fit accurately the necessary drills or other tools used.

Colour Lines Help to Simplify Processes

This is particularly true of certain forms of war work. At one large factory girls are being trained to do quite elaborate drilling jobs, as indicated in last month's *BUSINESS* (page 11).

One executive had a brain-wave on this subject. The problem is, of course, that when drilling a large frame three types of drill will be needed called fractional drills, letter size drills and figure drills. Obviously, the job is spoiled if a girl uses a $\frac{1}{8}$ drill where a .01065 drill should be used, and this was happening constantly with the new hand. Obviously, to the average woman, a $\frac{1}{8}$ inch meant nothing in particular.

What would interest women in the way of differentiation? The reply was colour. So now all the jigs for this particular job have coloured lines on them to show which sized drill is to be used. It was found that the workers had little difficulty in tracing the most intricate pattern in colours, indeed they rather liked it. The difficulty is that the colours of the spectrum are soon used up. But the forcing of drills through a jig has ceased.

This idea is surely capable of considerable extension, in making it easy for girls to become familiar with differences in size.

This Practice is Applicable to Smaller Concerns

At this point, impressed by the methods used, the reader may reasonably ask—are there any general principles on which one should work in a smaller concern to achieve the same results? I think the principles behind this practice and those of certain other concerns cited in last month's *BUSINESS* could be boiled down to three simple conceptions. In a reasonably efficient concern, available workers have been selected to suit the various degrees of skill, energy or strength required for the job. War time conditions make it more essential to fit the job to the man or woman rather than to rely on finding the man to fit the job. By careful analysis the work of skilled operators must be broken down wherever possible into a series of simpler processes.

Special jigs and tools must be supplied.

Thus it will be found that in the most complicated operations, the processes requiring real skill can be separated from those which can be done by unskilled workers.

Indeed the Institution of Production Engineers go so far to say that: This applies to practically all operations in the manufacture of engineering products but applies with particular emphasis to machining operations. Since the shortage of skilled labour is

CODE STEEL TUBE T45-53 1-2-3 GREY-RED-GREEN	
SKETCH 1	GREY
2	RED
3	GREEN
ALUMINIUM	YELLOW
SIF-BRONZE	ORANGE
STAINLESS	PURPLE
FAILED IN TEST	↓
AWAITING RESULT	/

Commence Test

Awaiting Result

Failed in Test

Passed Test

Examples

Colours in top section denote undergoing test.
Prefix in bottom section denotes stage of test.
Colours filled in on both sections denotes test passed.

NAME	APPROVAL	REG. No.	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST
J. B. ACLAND		531								
F. T. POLLACK		532								
J. F. FRANK		533								
P. S. BUTT		534								
D. T. LOMAX		535								
F. N. RYLAND		536								

This chart enables a close check to be kept on the progress of Bevin girls during their training period in welding

(please turn to page 26)

253 Factory Jobs a Woman Can Do.

Occupation	Depts. Cov'd	Occupation	Depts. Cov'd	Occupation	Depts. Cov'd
Assemblers	22	Grinders	3	Sewing Machinists ...	3
Armature Winders ...	1	Labourers—Foundry ...	1	Profilers	1
Bench Hands	5	Lavatory Attendants ...	2	Cleaners (Metal, etc.)	18
Braziers	2	Millers	8	Writers (Car Instru-	
Coremakers (Iron &		Dopers	7	ments)	4
Steel Foundry)	1	Paint Sprayers	6	Running in Gears ...	1
Charge Hands	9	Packers & Loaders—		Glaziers	1
Nibbling Machinist		Despatch	7	Messengers	
(Sheet Metal)	1	Polishers (Polishing		Table Hands (Sewing	
Car Cleaners	1	Spindles)	1	Room)	2
Capstan Operators ...	13	Power Press Operator	6	Leather Cutters (Body	
Browning Processes, &c.	1	Hand Press Operator	8	Work)	1
Clerks	6	Riveters	4	Writers Up (Electrolytic	
Sweepers & Cleaners		Sheet Metal Workers		Deposit Vats)	4
(Offices & Shops) ...		(Detail Assembly) ...	2	Numerators	1
Drillers	19	Solderers	4	Stitchers	5
Drivers (Vehicle-		Storekeepers & Assist-		Cable Splicers	1
Transport Section) ...	1	ants	5	Progress Clerks	1
Frazers	17	Tappers	2	Engravers	1
Fitters—Assemblers ...	2	Turners	1	Greasers (Sheet Metal)	1
Glass Fixers	1	Viewers	22		
Wood Polishers	1	Etchers	2		
Flatters	1	Welders	10		
Checkers	2	Linishers	1		

253

If you are short of workers, and who isn't, why not check up this authentic list of jobs suitable for women, based on exceptional experience in two wars

Which Jobs can the Bevin Girl do?

IN considering the question of absorbing unskilled women workers, two problems arise. Just how many jobs has experience shown women doing successfully? Given that large numbers of women are being absorbed, how can track be kept of their abilities and potential scope? (Foremen are rather more reluctant to advise the management as to exceptional talent among women than among men).

Probably no firms have used women in a greater variety of work than the motor industry. Many readers may recollect a couple of extremely vigorous reports, calculated to break down prejudice on the subject, contributed to these pages in 1916/1917.

Last War's Records Prove of Great Value

Very careful records were kept by one firm of their precise experience with women throughout the last war. These reports, coupled with the direct experience of many executives in 1914-18, made it possible to start practically where the work has inevitably been dropped in 1918.

As a result of this flying start and intensive work on the subject ever

since, formerly unskilled women are now doing 56 types of work on at least 253 jobs. The obvious jobs include light assembly, car cleaning, clerical work, cleaning, drilling, lorry driving, wood polishing, checking, store keeping, viewing, etching, machine sewing, wiring car instruments, leather cutting, stitching, progress, clerical work and tapping. More skilled work women are doing includes the winding of armatures, work at the bench, brazing, the operation of capstans, browning processes, fitting, grinding, the operation of milling machines, turning, running in gears, wiring up electrolytic deposit vats, splicing cables and engraving. Some of the harder and more nerve-wrecking of the women's jobs includes foundry work, paint spraying, packing and loading, the operation of both hand and power presses, riveting, soldering, welding and glazing (sheet metal).

For the convenience of managers the company are good enough to allow me to reproduce the complete list of the 56 main types of work done by women in their scattered works at present. Altogether, the company is now employing a substantial percentage out of the total force; the number has been doubled during the last few months; this increase continues as the

firm is compelled to replace the men called to the Services by women.

While this aggravates the training problem in one sense, it eases it in another. Although far more charge hands or leading operatives have to give time and attention to one or more unskilled workers, the company has actually been able to close down its training school.

There are three reasons for this step. One is that skilled labour is too valuable to be kept purely on school work. The second is that the number of women workers about the place seems to make it much easier for women to pick up their job. The third reason is, that operations have been still further broken down and simplified during the past few months to make the work easier for the newcomers.

Tasks Reduced To Their Simplest Terms

I think the management themselves are surprised at the varied nature of the work women are able to do when it is simplified. For these are not only doing 253 different jobs, they are scattered over the various factories.

Great care has been taken to reduce every type of work women are asked to do to its simplest terms. Further, in order to make the efficient woman worker as useful as possible a code has been arranged for each type of job. This enables the management to see exactly the number of women doing any given type of work. A second code

Second Progress Report on Concentration of Industry

800,000 War Workers MUST be found in Non-War Industries

LAST month I pointed out that the Board of Trade really meant business with the Concentration of Industry plans. I think that most wise business men realise that now. Further, the startlingly rapid issue of the following series of closing dates has convinced the doubters:—

May 17th	May 24th	May 31st
Toilet preparations	Toys	Fountain pens
Gloves (except woollen knitted)	Lighters	Pottery
Photo goods	Umbrellas	Cutlery
Sports goods	Plastics	Jewellery
Musical instruments	Combs	Linoleum
	Carpets	Leather goods
	Lace	Corsets
	Hosiery	Braces
	(incl. woollen knitted gloves)	

So soon as the closing dates are passed, the Board of Trade will take compulsory action in the industries concerned. In that case schemes will have to be prepared in double quick time. As a result some of them may be botched.

The Board of Trade is driven to speed not only by the urgent necessity of labour and space for the war industries but by two other Ministries, the Ministry of Supply, the Ministry for Aircraft Production and for workers by the Ministry of Labour.

After the closing dates, if events do not move quickly enough, it is clear that the Ministry of Supply will starve the industries or business concerned of materials, while the Ministry of Labour takes their workers. With the pressure now being exercised by the War Cabinet on Ministries there is not much doubt that action will be exceptionally quick and exceptionally ruthless.

What Non-Essential Industries Must Provide

It is now possible to envisage the scale of the problem. Of the 300,000 workers in the luxury industries covered by Limitation Of Supplies Orders, the Ministry of Labour wants 200,000 for the war industries. By the simple exercise of the Limitation of Supplies Orders it has already secured anything from 100,000 to 150,000 workers. The target for the present concentration of industry drive is therefore 50,000. At the same time the industries whose raw materials are under separate controls, cotton, wool, rayon, paper and paper users and boots and shoes are expected to yield 600,000 out of their 900,000 odd workers. This gives a total of around 800,000 men and women. It will simplify the task of finding 750,000 extra women to take the place of the

increasing number of men called to the services and put on skilled work.

It is now possible to record progress to date (May 6th). Under the Limitation of Supplies Orders, industries' written applications to the Board of Trade cover 97,000 workers, probably around a third of those formerly employed and about a half of those presently employed. In addition, verbal applications cover a further large number. Certificates have been granted, after further additional information has been supplied, to just under 50 per cent. of the written applications, i.e. to about a quarter of the present productive capacity of the industry.

Hosiery and Rayon Firms Show the Way

In certain cases progress has been faster in the industries under raw material Controls. For instance, 140 mills has already received certificates in the cotton industry, while 60 have been closed. In the boot and shoe industry applications from the trade are now being considered. In these industries the Controller concerned is dealing with applications under the present scheme.

Some examples of methods and the scale of concentration follow from a number of industries. In the viscose section of the rayon industry, 2,500 people have been freed for other work, altogether 16 per cent. of the industry's workers. The principal firm has closed several factories and has concentrated machinery and workers in others.

In the hosiery industry one concern

owning three factories is absorbing the whole of its own production into two of these and adding the production of another firm. In this way, two factories will be getting the output formerly obtained from four. In the case of one factory, under process of being taken over for other work, 55,000 sq. ft. of floor space is available, in the second 10,000 sq. ft. are freed. In this case the number of workers freed is rather smaller, being but 130 people out of a total labour force of 820.

In the same industry (hosiery) two quite small firms have worked out their own concentration scheme. In this case the total labour force concerned is 164 people. As a result of concentrating the work into one factory no fewer than 68 employees are freed along with about 7,000 sq. ft. of factory space.

Fulfilling the Requirements of Two Areas

A certain corset firm, which we may call A, is not only organised to absorb a second firm (B), but is concentrating its own entire production from several factories with that of B in one factory. In this way, one factory will secure the output formerly done by three. Further, in part of this factory a certain amount of Government work will be carried on.

In another month's time I hope that the Board of Trade will be able to estimate fairly accurately the number of people freed under the entire scheme, the factory floor space freed and the number made available. In almost every industry, it will be remembered, a certain amount of plant will be maintained in working order. This serves the double purpose of enabling the industry to make good any damage to nucleus firms through the blitz and also it will enable the industry to get a number of additional firms into production quickly soon after peace conditions return.

The necessity for concentration is particularly urgent in towns where much war work is going forward. One toilet firm in such an area is doing an ambitious job in this direction. It is concentrating its own production and

"Even if it is late . . . the best thing a small concern can do is to arrange every detail of a collaboration with one or more other small firms in their industry"

says Cecil Chisholm in this article

See also "Seven Concentration Questions Answered" on page 20

By Winifred Raphael *

of the National Institute
of Industrial Psychology

How many of your workers are absent or late for duty from preventable causes? Remedies for this needless hinderance to Britain's war effort are often simple and easy to introduce



This Plan Helps to Reduce The Trebled War - Time ABSENTEEISM and UNPUNCTUALITY

AIR raids, Home Guard and fire-watching—housework and shopping in the case of women—are all responsible. Here an official of the National Institute of Industrial Psychology gives some plans that have helped to reduce both.

In one well-conducted factory employing women engaged in especially urgent war production, the working days lost through absenteeism, even before the occurrence of air raids, was nine per cent., which is perhaps three times their normal rate. This factory was on shift work, and it is interesting to note that there was no more time lost on night work than on day work. The first few heavy raids caused heavy absences of one day (132 out of 150 operatives in one department), but now raids only keep people away when traffic is badly dislocated. Another factory had eight per cent. of its women away and two per cent. of the men.

Generally women show a much higher rate of absence than men, and married women are away more than single girls. An analysis of the cause of absenteeism among women shows that in order of importance they are—home circumstances, illness, lateness.

Home Influences

Most married women in factories perform the amazing feat of doing a double job adequately—putting in a full day's work in the factory, and keeping a home running also. This is difficult enough to do under peace-time conditions, but it is almost impossible when the factory is demanding overtime, and shopping has become a matter needing time and diplomacy. When women take a day or an afternoon off, it is generally to do the family shopping while the shops are well stocked. If big factories could arrange for their canteens to sell rationed and other essential articles of food and

allow women to make purchases in their lunch-break, much absenteeism would disappear. Still, it would not disappear entirely, for there would always be husbands home on leave, some hitch in the arrangements made for the care of children, or repairs and salvage to be seen to when a home is damaged in an air-raid.

It is not only married women who take time off because of home circumstances. When the "boy friend" comes home on leave, or when parents are ill, the young girl also naturally takes a few days from work.

Illness Often The Excuse

Illness is the most convenient excuse for absence; so certainly more people claim it as a cause than are justified in doing so. Even the operative himself may sometimes be deceived; have not most of us at times wondered to ourselves if our strong distaste for doing a certain job is due to a temperature or to laziness? Even where illness exists, its cause is often psychological. Most factory doctors would agree that to say that a third of all sickness absences are psychological in origin would be an understatement.

But although sickness is, after home circumstances, the most frequent cause of absenteeism, evidence goes to show that the sickness rate has not increased since the war.

An alarm-clock fails to arouse, or a raid dislocates traffic, and the operative knows that he is going to be an hour or two hours late in arriving at work; he often decides that the best course is not to go at all. This occurs particularly if the management is strict on punctuality, but can be reduced if all employees are interviewed about one-day absences.

Unpunctuality

Probably the loss of production due to unpunctuality is not less than that

lost by absenteeism. Even where discipline is firm, one-quarter of the people may "clock in" late; and where it is slack, this proportion may increase to three-quarters. There seems to be little difference between the punctuality rates of men and women.

Unpunctuality is not only shown in late arrival at the factory, but also in the slow start of work, especially after a heavy raid. It is said that more production has been lost due to conversation about last night's bombs than was ever lost by direct hits.

Certainly the most important cause of unpunctuality is poor transport, especially in the winter. All town-dwellers know the fierce battle for trains and omnibuses due to the compression of the rush hours to avoid the "black out." This, of course, may be heightened by air-raid damage to tramlines, railway tracks and roads, so that journeys that used to take half-an-hour may take anything from one to three hours.

Another cause of unpunctuality is the shortage of labour. Operatives know that firms engaged on important government contracts cannot afford to lose or even suspend them; a minority take advantage of this and arrive with regular unpunctuality.

All those conditions described above as causing absenteeism also have an adverse effect on punctuality.

Some Suggested Remedies

Many of the causes of absenteeism and unpunctuality are so natural that it is impossible to help being sympathetic, and most managements have wisely adjusted their standards to new conditions. However, as nothing must needlessly hinder war production, some means must be found to minimise the effects.

This can be done in one of two ways—either attendance can be improved or the factory organisation adjusted so that an individual's bad

* "Occupational Psychology," April, 1941.

attendance does less to hinder production.

In districts where additional labour is still available, this second alternative is likely to be the most successful as well as the most merciful. For example, the National Institute of Industrial Psychology recently co-operated with the management of a factory in organising reserves of labour for all key positions. These understudies were specially trained to be ready to replace skilled operatives, but were employed normally on jobs that could be postponed. Such a scheme, when based on proper selection and training, is a real insurance of satisfactory working and smooth production, and it is satisfactory for the operatives, as it offers juniors opportunities of promotion to better-paid jobs.

In most districts, however, it is now impossible to get enough operatives, let alone a surplus. Sometimes, however, a reserve of workers can be found who only give part time. Thus one factory is experimenting with short double shifts (7 a.m. to 1 p.m. and 1 p.m. to 7 p.m.), which can be worked by women whose home duties would not allow them to take a full-time job. Other factories have experimented with giving operatives half a day or two early evenings off a week to shop (or a Sunday off where seven-day production is required) and substituting with volunteers.

Appeals and Slogans Help

But where national work is urgent, and there is no reserve of labour to be tapped, then it is necessary to make an appeal to the patriotism and generosity of the operatives, and such appeals never fail to have an immediate response in improved attendance. The form of the appeal may vary—it may be a speech from the managing director; it may come from the Works Council; or it may be inspired by the operatives themselves. In several factories "slogan competitions" have been held. The operatives have been asked to suggest slogans stressing the national importance of their work and the need for regular attendance. This in itself arouses interest, and the subsequent weekly display of a new slogan keeps that interest alive for some time. Another method is to arouse interest in production, either by giving a goal to be reached in a short period, or by stimulating competitions between shifts. Competition between shifts sometimes causes such enthusiasm that foremen induce their shift to come in promptly or even early. If pride in output is to be used as an incentive, progress should be shown in concrete terms, for instance, as a figure climbing up steps on a ladder.

If operatives know that their absences and punctuality go unnoticed they will naturally make less of an effort than if some responsible person (be it department manager, foreman, personnel manager or nurse) interviews all frequent transgressors or even all

(please turn to page 32)

MOTION STUDY

is more Important than Time-Study for INCREASING OUTPUT

by **Stewart M. Lowry ***

*Director of Industrial Relations
Procter and Gamble Company*

Harold B. Maynard

*President, U.S. Methods
Engineering Council, and*

G. J. Stegemerten

*Staff Supervisor, Westinghouse
Electric & Manufacturing Company*

THE history of time and motion study in this country has been more than chequered. Far too much emphasis was placed on the stop watch and far too little on the value of motion study and psychology. Worse still, the whole system was clumsily applied in most cases by certain untrained executives. Frequently, what was tolerable to a tough, ambitious American worker quickly proved to be intolerable to a more sensitive and less ambitious British worker.

During the past few years, however, even the Americans have realised their errors in concentrating on quick results. They are now paying much more attention to the scientific study of the worker's motions with a view to easing effort and to securing a comfortable rhythm.

At the moment the importance of time and motion study in this country lies in doing everything possible for simplifying the work, enabling unskilled workers to be quickly trained and for enabling the accurate setting of piece rates.

As many an executive who has little experience on the subject is now called upon to deal with these questions, many of my readers might be interested in the latest statement of the vast practice in time and motion study work in America, "Time and Motion Study," McGraw-Hill Publishing Co., 35/- Lowry, Maynard and Stegemerten.

Reasonable Conditions Help Speed

It is interesting to find from these conservative authors, that time and motion study is still producing increases in output and saving in labour as the following table shows:

	Incr. in prodn. per man %	Reduc. force %	Incr. in indiv. earnings %	Saving in labour cost %
Making concrete slabs ...	400	0	100	62
Cleaning castings	144	59	35	45
Removing gum tape ...	400	80	67	67
Storeroom ...	88	47	25	34
Crating ...	400	80	108	58
Band saws ...	200	67	70	43

The authors emphasise that the above increases were not obtained by speeding up the workers to an undue extent. In each case they used to demand only a reasonable accomplishment on the job by ensuring that conditions were made as comfortable

as possible for the worker and finally by the setting of a reasonable piece rate.

Most interesting is the authors' new statement of the laws of motion economy and of how they operate, which I give below:

Laws of Motion Economy

1. When both hands begin and complete their motions simultaneously and are not idle except during rest periods, maximum performance is approached.

2. When motions of the arms are made simultaneously in opposite directions over symmetrical paths, rhythm and automaticity develop most naturally.

3. The motion sequence which employs the fewest basic divisions of accomplishment is the best for performing a given task.

4. When motions are confined to the lowest practical classifications, maximum performance and minimum fatigue are approached.

5. When conditions are the same, the time required to perform all basic divisions of accomplishment is constant for any given degree of skill and effort.

Corollaries to Motion Laws

1. Hesitation, or the temporary and often minute cessation from motion, should be analysed, studied, and its cause accounted for and, if possible, eliminated. When various parts of the body do not begin or complete their motions simultaneously, the resulting

* "Time and Motion Study," London: McGraw-Hill Book Company, 35s.

balancing delay should be recognised and recorded as being necessary.

2. The shortest time taken for each motion during the course of the study made on an expert operator should be considered the desired standard; all variations of time from this standard should be analysed for each motion and the causes determined and recorded.

3. The best sequence of motions for any one class of work is useful for suggesting the best sequence for other kinds of work.

4. Where delay occurs, consideration should be given to the advisability of providing additional work which will permit utilising the time of delay, if study indicates that the delay is unnecessary for overcoming fatigue.

5. All material and tools should be located within, or as near as possible to, the normal grasp area.

6. Tools and materials should be located so as to permit the following of the proper sequence of motions. The part required at the beginning of the cycle should be next to the point of release of the finished piece of the preceding cycle.

7. Tools and materials should be pre-positioned in order to eliminate the search and select basic operations.

8. Hands should be relieved of all work that can be done with the feet or other parts of the body, provided there is other work which the hands can do at the same time.

The most important of these laws is the fourth. But what is meant by the "lowest practical classification of motion?" This the authors describe very clearly.

All physical motions are divided into five classifications according to the bodily parts involved in making them. They are as follows, arranged with the most economical and least fatiguing first:

1. Finger motions.
2. Finger and wrist motions.
3. Finger, wrist, and forearm motions.
4. Finger, wrist, forearm, and upper-arm motions.
5. Finger, wrist, forearm, upper-arm, and body motions.

The fifth class requires a change of posture, while the first four do not. Motions of the first class are performed most quickly and with the least expenditure of energy, while motions of the fifth class obviously require more time and effort. Hence, it is always desirable in arranging the work place and in determining the best method for doing the work to have as many as possible of the motions in the lower classes.

Practical Lifting Explained

If all necessary motions could be reduced to the first class, no further improvement could theoretically be made. In studying any job, the ultimate aim should be to reduce all motions to the lowest possible class. The foregoing should, of course, be interpreted with common sense. It might be possible by exerting a prodigious effort to lift a heavy object an inch or so with a finger movement, but the same object could be lifted the same distance in less time and with far less fatigue

by a finger, wrist, and forearm movement. In actual practice, there is no difficulty in recognising the lowest practical classification.

In most cases, the attempt should be made, to eliminate all fifth-class motions and to reduce as many fourth-class motions to third-class motions as possible.

Into the methods of motion study based on these principles the authors go at great length. I can recommend their treatment especially to those concerned with the training of workers. More interesting to the average managers are their suggestions for improving the way in which the work is done by whatever means.

Motion Possibilities Analysed

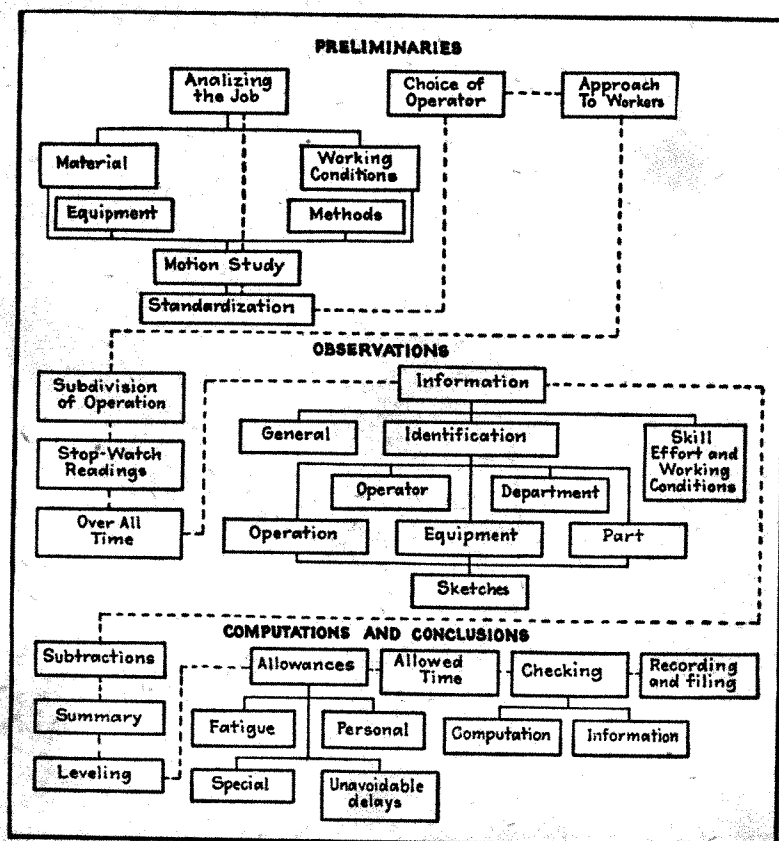
The operation analysis up to this point will usually bring to light a number of possibilities for improving methods. Among the various things which may be done to improve methods, there are ten which are sufficiently important to justify separate consideration. Experience has shown that one or more of these ten common possibilities for improvement can be applied to practically every job studied. The possibilities are listed under item 7 on the back of the analysis sheet and are as follows:

1. Install gravity delivery chutes.
2. Use drop delivery.
3. Compare methods if more than one operator is working on same job.
4. Provide correct chair for operator.
5. Improve jigs or fixtures by providing ejectors, quick-acting clamps, etc.
6. Use foot-operated mechanisms.
7. Arrange for two-handed operation.
8. Arrange tools and parts within normal working area.
9. Change layout to eliminate backtracking and to permit coupling of machines.
10. Utilise all improvements developed for other jobs.

Gravity delivery chutes are useful in bringing material to the point of use or taking it away from the point of use after the job has been done. Such chutes are usually quite simple to make.

Drop delivery is the term used to express the thought of using gravity as a means of moving material or tools, usually away from the point of use. Where gravity cannot be utilised, the effect can sometimes be obtained by attaching the tool or other object to be disposed of to a cord running over a pulley and attached to a counterweight or to a spring-wound reel. When drop delivery is used, the motions required to dispose of tools or material are reduced to a minimum.

This book is clearly worthy to rank with Professor Barne's classic treatment of the subject. It is a pity that the authors have not included a description of modern equipment. But this is a minor flaw.



Graphic Analysis of the Elements of Time Study

Management in War-time . . .

A Cure for Workers' "War Nerves"

AS an excuse for haphazard work, absenteeism and general slackness, "war-nerves" are so familiar to employers that any methods of soothing the worker who pleads this complaint is eagerly sought.

Strict supervision has been found in most cases, to increase the trouble rather than reduce it. Many firms have issued definite instructions to overseers and foremen that nothing must be done to aggravate employees who display any symptoms of this "complaint."

In place of driving methods, one leading manufacturer has advised his executives to display a spirit of camaraderie to war-nerve-strung workers. Gone are the old orders aimed at speeding production and in their place are friendly chats on the work in hand and topics in general. Hailed by a superior with "How's things?" and encouraged to speak openly on a number of subjects many workers have been easily cajoled into top-speed production, when strict discipline would only have led to work slowing down and a general feeling of resentment created.

Where this system has failed, workers have been offered the chance to take things easy for a few days by working in a department largely staffed by trainees, who necessarily labour at a reduced tempo. A short spell there will usually be found to provide the incentive for normal speed work in the old shop.

Keep Abreast of Mailing List Changes

OVER seven hundred out of a total of 2,000 addresses, more than 35 per cent., of the mailing list of an important firm was found to be valueless within a few months of the previous complete check. "Joining the Forces," "dead," "gone away" and "already a regular customer" were the four most frequently used reasons for this heavy wastage.

Many other firms are finding their mailing lists in similar state. The editor of one of the best-thumbed reference books in the country, *The Advertiser's Annual*, states that changes of entry details of newspapers, advertising agencies, etc. have reached the colossal total of between 75 and 80 per cent. during the past year.

This shows the immense importance of frequent revision to meet the rapid changing conditions produced by total war. Efforts to make a complete check on an individual district should be started within a few days of news of serious bomb damage in the area. Such alertness will go a long way to

convince a customer of the firm's eagerness to serve and may lead to the customer giving news of future changes as they occur.

It will be found that the bigger the unit of sale, the more readily will the customer co-operate to enable a firm's list to be kept up to date. Conversely, with sales in small units, the degree of help from the customer will be small.

Contact between a firm and both its customers and suppliers are the life-blood of trade. Whilst the cost of frequent checking may seem unduly heavy, it will be readily realised that but for this contact business would stagnate.

You Can See if Correspondence is Held Up

A GOOD way of getting correspondence to the appropriate departments and executives is to place the sorted mail in a row of baskets on a counter in a place easily accessible to executives and their secretaries—preferably in a corridor through which they pass. Each basket has the name of an executive or department on it, so that anyone who is passing can pick up any mail for him that may be there.

Of course, there is in addition a periodical delivery, but this method saves waiting about for messengers.

Turn a Dead Loss into Profit

THE present high cost of paper involves firms employing numbers of employees in a substantial weekly bill for wage envelopes. This expenditure could be cut, if not turned into an actual profit, by selling the back of the envelopes, usually blank, to advertisers not in competition with the firm.

With the restricted size of newspapers and ban on posters, there is a dearth of advertising space. The opportunity of getting a short sales message to the potential customer just at the moment when he or she receives the money to spend on necessities and luxuries alike, makes the few square inches on the wages envelopes a valuable advertising space. If three or four advertisers were used alternately there would be no monotony in the "copy."

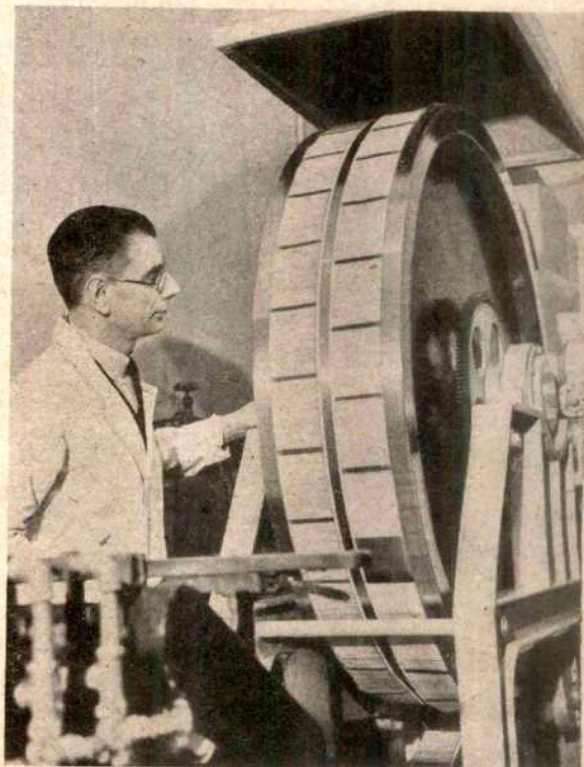
Urge Light Economy with a Laugh

INSTEAD of sending memos round to employees urging them to switch off lights when not in use (and thereby wasting paper!) try pasting a humorous inscription (possible in rhyme) just under the switch. It is far more effective. Here's an example:

Save our juice,
O! Save our juice
Switch me off when NOT in use.
THANK YOU!

1½ Cwts. of Mail Reduced to 16 Ounces!

An experimental 3d. "airgraph" letter service—the first of its kind in the world—has been introduced to cheapen and expedite the postal services of British troops in the Middle East. Under this new system, by which a letter will be less than a fortnight in transit, the sender writes his message on a special form 11" x 8", and prints the address in block letters at the foot. The complete form is photographed on to a small film, which is shipped by aeroplane to its destination. On arrival there an enlargement is made. This is placed in an envelope with the block printed address showing through a cut-out pane. The service means a great reduction in weight and space of correspondence, 4,500 film negatives weighing only one pound. An equivalent number of ordinary letters would weigh 1½ cwt. The commercial possibilities of the system are obvious. The photograph shows the enlargements being dried on arrival at their destination at the speed of 40 letters per minute.



These Monthly Figures Tell us the *Truth*

THERE are many systems of costing, and it is impossible to propound one that will do for all.

One system, however, with slight alterations will do for any number of firms making similar types of goods.

Many firms have to their regret copied another firm's system slavishly only to find that like Saul's armour, it would not do for David. Neither will one firm's system do for *all* manufacturers, but skilful adaptation is often possible.

One firm was until recently making a very common error in the preparation of its monthly statement of profit and loss. They made the mistake of

At one time this firm's monthly statement of trading hid the true position. It failed to show variations in gross profit. Now it includes these and so reveals the exact situation.

A simple cost record system that suits this small firm, employing 100 people, is described.

By G. T. CARTER, F.C.I.S.

Managing Director and Secretary, Thos. Staniforth and Co. Ltd.

assuming that *the same percentage of gross profit is made on all the sales.* This is usually just nonsense.

The cost sheets, or monthly trading accounts, are prepared (Form A),

month after month, showing nett profits, and the directors and management are naturally delighted with themselves over the prospects of a successful year.

The 12-monthly sheet having been prepared, the annual audit is awaited with interest. When it arrives, it shows the profit, as per the audited trading account, is very much less than the expected figures as per the monthly account. In some cases a loss has been made. If these cases were investigated, you would find in the case of manufacturers many of them were committing the same mistake of assuming that they make, say, 50 per cent. gross profit on their sales.

Form B, very clearly illustrates my point. As you will see the sales, and overhead charges, and expenses on both sheets are exactly alike. Yet the nett profit shown on form B is £175 8s. 4d. less than that on form A. Multiply this amount by twelve, and you will readily see how easily these big differences arise between the 12-monthly cost sheet and the audited trading account.

Yet it is usually only one item that is wrong—*Estimated Gross Profit, or Estimated Cost of Manufacture.*

It is quite obvious that sheet A is unsatisfactory for manufacturers, whose products as a rule do not show the same amount of gross profit. Therefore sheet B will suit most manufacturers.

We have used this system for over twenty years now, and have been able to ascertain month by month our actual nett profit. Except for minor items (and these are generally known to us), the cost sheets have at the end of the twelve months shown very much the same results as the audited account.

How The System Is Worked

We have all our books ruled and headed to fit in with the cost sheet heads. Before we commence preparing the sheets, each set of books are proved, or balanced, every month as follows:—

Cash book balanced with bank book.

Sales ledger balanced.
Bought ledger balanced.

Finally a trial balance is taken out *each month*.

A Misleading Monthly P. and L. Statement.

Dr.		£ s. d.		Cr.		£ s. d.	
Unproductive Wages	A	765	15 2	Sales : £10183	8 10		
Coal and Coke	A	443	10 9	Estimated Gross			
Carriage	A	214	2 10	Profit, 50% ...	5091	14 5	
Rent and Rates	E	90	0 0	Discounts received	58	15 8	
Insurance W.C. and Fire ...	E	72	10 0				
Nat. Health, Ins. and Unemp.	A	103	13 0				
Discounts allowed	A	210	11 10				
Salaries	A	491	6 8				
Warehouse	A	160	0 7				
Transport Expenses	A	186	6 10				
Stamps, Stationery, Office Exs.	A	348	13 9				
Repairs and Renewals	A	176	19 11				
Commissions (Agents)	A	240	6 3				
Holidays with Pay	A	60	0 0				
Sundry Trade Expenses	A	59	1 5½				
Bank Charges	E	35	14 11				
War Risk Insurance	A	25	0 0				
Productive Expenses	A	199	11 6				
Bad Debts	A	18	13 2				
Estimated Nett profit		1239	11 5½				
A—Actual Expenses.		£5150	10 1				
E—Estimated ..							

An Accurate Monthly P. and L. Statement.

Dr.		£	s.	d.	Form B.
Cost of Wages and Material to produce the Sales X	5267	2	9	By Sales	10,183 8 10
Unproductive Wages A	765	15	2	Discount	
Coal and Coke A	443	10	9	Received	58 15 8
Carriage A	214	2	10		
Rent and Rates E	90	0	0		
Insurance W.C. and Fire ... E	72	10	0		
N.H.I. Unemployment A	103	13	0		
Discounts allowed A	210	11	10		
Salaries A	491	6	8		
Warehouse A	169	0	7		
Transport Expenses A	186	6	10		
Stamps, Stationery, Office Exs A	348	13	9		
Repairs and Renewals A	176	19	11		
Agents Commission A	240	6	3		
Holidays with Pay A	60	0	0		
Sundry Trade Expenses A	59	1	5½		
Bank Charges E	35	14	11		
War Risk Insurance A	25	0	0		
Productive Expenses A	199	11	6		
Bad Debts A	18	13	2		
Estimated Nett Trading Profit	1064	3	1½		
A—Actual Month's Expenses.	£10,242	4	6		
E—Estimated					
X—Transferred "from Form C.					
					£10,242 4 6

Summary of Day Book. Selling Prices				Sales Summary.		Cost of Material Wages & Bonus.		Form C. Total Cost.	
				Total Sales. £ s. d.				£ s. d.	
175 doz.	Hoes @ 5/9	doz.		50 6 3		3/6 doz.		30 12 6	
50 "	" "	"		15 0 0		4/- "		10 0 0	
24 "	" "	"		7 10 0		4/- "		4 16 0	
18 "	" "	"		5 8 0		4/- "		3 12 0	
1 "	Irons 108/-	"		2 14 0		70/- "		1 15 0	
10 "	Bill Hooks 34/-	"		17 0 0		X 16/- "		8 0 0	
	etc. etc.					etc. etc.			
	etc. etc.					etc. etc.			
18 "	No. 430								
	Knives 42/-	"		37 16 0		23/- "		20 14 0	
				£10,183 8 10				£5,267 2 9	
								Being Total Cost carried to Form B.	

X—Price obtained from FORM D.

Form D. Works Cost Sheet.			
BILL HOOK			
	Material. 24 lbs.	Wages. s. d.	
Steel 1½ lb. ...	3 0		
Wood ...	4		
Ferrules ...	4½		
Making ...		4 9	
Filing ...		1½	
Hardening ...		5	
Handling ...		6	
Grinding ...		2 6	
Haft Turning ...		3	
Oiling & Painting ...		3	
	3 8½	8 9½	
Bonus		3 6	
		12 3½	
Material		3 8½	
Total	X 16 0		

X—this figure transferred to FORM C.

This ensures the figures on the cost sheets being correct.

At the end of each month the day book is ruled off, totalled up, and the first stage in the preparation of the cost sheets is begun.

A "summary" of the day books is prepared, showing the total number of each article sold, with the price. The total of the sales summary, of course, coincides with the total of the day book, and is really another copy of the day book; but in a summarised form, it shows the quantity sold and the price obtained for each article.

Having got the sales summary, (Form C), we immediately put in the works cost price, i.e. what the article has cost in material, and wages, from the works cost sheet (Form D).

(This system of course is only reliable when the articles are made as in our case by *piece workers*).

"Unproductive wages" is a very deceptive item. Very few firms realise the amount they pay until they begin to get them out in detail.

Each week, the employees enter, in the space provided on the wages sheets, the number of hours they have been engaged on unproductive work. These hours are transferred each month by the department managers into their respective unproductive wages books. The total is then transferred to the cost sheet, making item No. 2 on the debit side.

"Estimated" item, on the debit side include rent, rates, insurance, etc., and are based on the previous year's figures, which can be adjusted if necessary.

Coal, coke, carriage, stamps, stationery, and all other debits are the actual expenses incurred during the month. They represent the monthly

total shown in the impersonal ledger, that has been posted from the cash book, petty cash, and invoice journal.

We find this system very sound and reliable. It entails no extra clerical work, as once the staff has got used to the method, it becomes a help to them, reducing mistakes in book-keeping.

The sales summary is then extended, and totalled up. This gives you the total amount it has cost in material and wages, to produce the goods sold that month, and the total cost £5,267 2s. 9d. is transferred to the cost sheet (Form B). By this method practically the exact cost is ascertained, and the first item on the debit side is ready.

Stopping Three Office Leaks

NOWADAYS avoiding waste in the office is not only a question of saving money; it is a question of saving manufacturing and shipping space for the production of more urgently needed commodities.

Let us look round the office and see where waste is likely to occur, and how it can be checked. To begin in the typist's room—*Carbon Paper*.

Once carbon paper gets crumpled, it is, if not useless, at least untidy to use, leaving a network of lines all over the copy. Therefore, the typists are asked politely, and in the interests of the war effort, to put their carbon paper away flat at night.

Next they are told that each sheet of carbon paper should be used between sixty and seventy times, and asked not to throw used carbons away until they really are worn out.

A tip they are also given in this connection is to turn the carbons upside down after a while, in order to have the unused top part at the foot of the page.

Telephone Chatter

We all know how difficult some people find it to wind up a telephone conversation. Where trunk-calls are concerned, this is not only a matter of keeping the lines engaged when they may be needed for important national matters, but is a very great expense.

A good idea is to provide all executives who have to make frequent trunk-calls with a sandglass of the kind used for timing eggs. Ask these executives to turn the sandglass over when they begin a trunk conversation and keep an eye on it. This unusual reminder of the passing of time is a

wonderful curb on those meaningless verbiages and repetitions which usually bring a telephone conversation to a close.

Pin-Money

The amount of money spent on pins, paper-clips and other oddments in even a moderate sized business is staggering. This is usually because the supply is too abundant. Make it necessary to requisition supplies and have records kept of the dates of issue, and the consumption will drop very abruptly.

It seems hardly necessary at this stage to mention stationery, but it is a surprising fact that some firms are still using quarto sheets for letters which would easily fit into a sheet half the size. A great many internal memos too, are still sent concerning matters which could be dealt with just as efficiently over the house telephone.

As for carbon-copies! There never was any need to use a separate sheet for the second page—it takes up room in the filing cabinet and is likely to get separated from the first sheet. Tell typists to use both sides of the paper for their carbon copies.

In this supplement ways and means of improving the A.R.P. organisation are discussed for the benefit of Executives in charge of A.R.P.

A.R.P. Supplement to BUSINESS

MAKING THE INDUSTRIAL

Points for the Industrial A.R.P. Organiser

ALTHOUGH an air raid attack which results in the bombing of one's own business or industrial company may never occur, industrial A.R.P. organisers have as their main job the building up of an efficient A.R.P. service within the business or works in their charge.

What are the main points in securing an efficient A.R.P. personnel? They all come under the heading of training:

The personnel must be completely familiar with the works, with the distribution of equipment, with the safe places, with the routine of business or

factory organisation. The A.R.P. personnel must have adequate chance of learning an essential routine in dealing with the effects of enemy activity. They must understand not only the principle *theoretical* ideas on fire-fighting, first aid, rescue and decontamination work, but go through adequate tests. They must have some practical ability in this work.

If the training is undertaken in an imaginative way, much can be done to build up an efficient organisation. There must not only be lectures, but tests as well, even competitions between the various parties in the works if

there are sufficient of them.

A room provided where books, periodicals and other information on A.R.P. is available is a useful idea. There should also be close co-operation with the local authority and with other business or industrial undertakings nearby, as a bombing raid is unlikely to be only against your own business. If methods of co-operation with the other services likely to operate during the raid is established well in advance, the work will be far easier when it has to be done.

To take some of these points in detail:

The Personnel must be completely familiar with the works.—

Even in small business premises there are often cellars, passages, rooms, cupboards, and other places where one does not enter in the normal course of events. All those who have A.R.P. duties in the works or business premises must be taken round and shown every detail—remember, fire watchers will have to find their way about the premises in the dark, and this is not always easy even in a straight-forward place.

Distribution of equipment.—

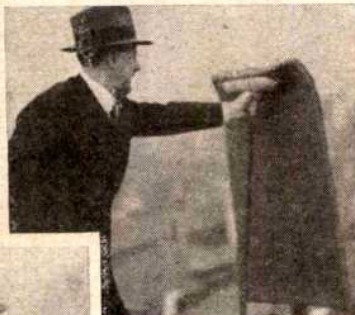
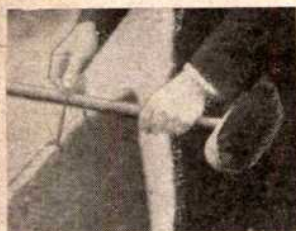
Some system of marking (some have even found it useful to use luminous paint) all equipment for A.R.P. purposes must be devised and all A.R.P. workers made absolutely familiar with this equipment.

Safe places.—In most buildings or works there are places, in stairwells, next to chimney stacks, in shelters or strengthened corners where a greater degree of safety can be obtained during an immediate danger period. These should be sought out and A.R.P. personnel should learn to get to them quickly should it be necessary, just as they should be able to get to key-man-shelters, etc.

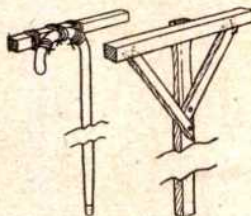
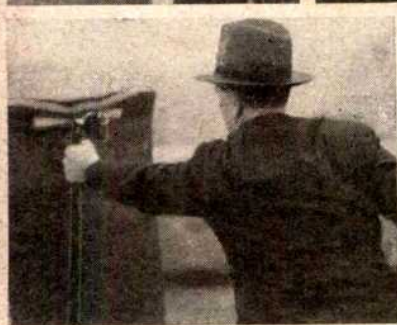
Learning an essential routine.—

There is no doubt that such training as the A.R.P. parties (fire and casualty particularly) had before the blitz started helped substantially in making them ready to meet the various emergencies, but many people thought their training was insufficient. It can therefore be seen how important it is to plan a considerable time ahead in the training of personnel, and to help in this, there are several books which give tests and drills and descriptions of competitions, etc.*

*In "Casualty" by G. B. Shirlaw, (Secker and Warburg) (8/6) a complete range of tests and competitions for first-aid parties is given.



Leslie W. Berrill gives readers of BUSINESS a useful hint for affording some protection when approaching a fire bomb—advantage, the doormat can still be used as such until the fall of an incendiary. The drawing shows wooden handle which can be easily made.



This hint comes from a leaflet, a copy of which will be sent free to responsible executives who send a stamped addressed envelope to the publishers "The Gordon Press," 10 St. Bride Street, E.C.4.

L.C.C. also Has Its Watchers Problem

The problem of finding 12,000 fire-watchers to maintain a 24-hour watch on London's 450 elementary, secondary and technical schools is facing the London County Council.

As a result the Council are having to seek the aid of the local authorities in whose areas the schools are situated.

When the fire-watchers' order came into force the Council took a census of the personnel available for duty. But it was found that if every teacher and member of the maintenance and administrative staffs played their part in fire-watching the numbers would fall far short of those required.

The Raid Spotters' Pocket Book and Log, Charles Letts & Co., 1/6.

The Raid Spotter's Pocket Book contains some 30-40 pages of technical data such as: identification details of a wide range of planes; hints on raid spotting by visual and sound methods; tables of heights and distances; illustrations of the various types of clouds, etc.

The rest of the Log Book is composed of space for such data as:—date, time, and kind of occurrence; duty rosters, space for illustrations and description of additional planes; and pages for other notes.

A.R.P. SYSTEM WORK

Night and Fire Spotting

By FRANCIS CHICHESTER. *Allen and Unwin, 1941. 2s. 6d.*

A number of booklets and pamphlets have already been published dealing with fires and incendiaries. They overlook the fact however that a great deal of the fire-watcher's time on the average is spent in fruitless anticipation, which, with bitter experience is likely to be replaced by an equally unintelligent state of indifference towards anticipated trouble. To a large extent also fire-watchers are exposed to a considerable degree of unnecessary risk through bad organisation.

Mr. Chichester, whose "Spotter's Handbook" has deservedly become a best seller in its line (and is now available in a cheap edition—2s. 6d.) has brought out this little book to cover the above points effectively. Inevitably, the functions of the Night and the Day Spotters have much in common. Experience in the one

field helps with the other. Most of the material in this book is new however, and important. There are certain omissions which might receive consideration in another issue: such as the use of trumpets or radio, or the more precise location of sound direction, this being half the problem at night.

Detecting the positions of fires already started by triangulation might be considered, or by plotting their fall the spotter may deduce their intention, which is as likely to be a certain area within a town or city as an isolated works.

The position of street fire watchers is briefly touched upon in the book but their position remains unsatisfactory. Mr. Chichester does not consider the direct use of Observer Corps findings practical but some co-operation with the official fire services might be possible. The book is well-written, well-informed, ingenious, practical and necessary.

J.D.S.

Points for an Efficient Casualty Service

New Recommendations for Burns Treatment

Following the withdrawal of the Ministry of Health instruction that tannic acid was to be used in the treatment of burns, comes new recommendations by the Co-ordinating Team on Burns, appointed by the War Wounds Committee of the Medical Research Council.

Minor burns, declare the Team, which do not require admission to hospital should, after cleansing the surface with plenty of soap and water, be dressed in the following way:

1. In the case of the face or hands, with gauze or lint impregnated with sterilised Vaseline.

2. In other parts of the body with tannic acid jelly or gentian violet jelly, one per cent. If jellies are used, no dressing should be applied over the burnt area, and clothing must not be allowed to come into contact with the burnt area until the coagulum has formed and is dry. The application of tannic acid or other coagulant jelly to the surface of a burn which has not been adequately cleansed is inadvisable.

Serious burns requiring admission to hospital should be treated by the application of sterile Vaseline on gauze or lint to cover the exposed portions of the burn. It is hoped that in the near future a non-greasy substitute will be available for use instead of Vaseline.

Provided the patient is shortly to be transferred to a nearby hospital, no attempt should be made to remove clothing in order to expose the entire burn area. Serious burns always require injections or morphine for pain in full doses.

Casualty Lift which Makes Work Easier

The quick and efficient loading of stretchers when patients have to be removed from inaccessible places presents many obstacles. A new device which

has been purchased by Ministry of Home Security goes a long way towards solving many of these difficulties.

It consists of four lengths of webbing, two long ones for supporting the larger parts of the body, the hips and shoulders, and two short lengths for the feet and head. Each webbing strap is fitted with special type handles which can be folded back to enable the straps to be passed readily under the patient. A special technique is used for loading the "lifts" and training is simple.

One of the main features of this method of stretcher loading, is the ease with which patients can be removed from the base of walls, and piles of masonry caused by enemy bombing. The patient is comfortable, and even spinal injuries can be dealt with safely.

This device is worthy of inclusion in the standard equipment of every First Aid Post, and many factories and offices all over the country have already adopted it.

Treatment of a Case of Blast Injury

The greatest care must be exercised so as to avoid any further injury to the lungs, broken ribs, etc., but it is essential to get such a casualty breathing again, and the only method practicable is by Schafer's method. This method should be applied gently. The amount of CO₂ near the mouth should be increased as much as possible by either breathing near the casualty's mouth or by using, if it is available, Sparklets Resuscitator.

At the same time the casualty must be treated for shock, in other words, essentially he must be kept warm. If the casualty is breathing when found, the treatment is that of a shock case.

Readers of BUSINESS are invited to send their A.R.P. queries to the editor. Information on every aspect of Civil Defence is available

Trap Clears Away Fire Bombs



Above: the incendiary fire bomb trap open and placed over the bomb. Right: the bomb drawn into the trap which is now closed.



The "MTL" bomb-trap consists of a strongly constructed, fire-resisting, metal

box with detachable front in the form of a scoop. The scoop is fitted to two sliding arms, controlled by means of a supplementary metal shaft parallel to the main handle, which is of wood. A long rake is also supplied, for use in cases where incendiary bomb may have lodged. It is the work of an instant to open the scoop, snap up the bomb, the same action automatically enclosing it in the fire box. The trap also scrapes up any molten metal which may have been given off, thus removing an additional source of danger.

In use during a recent blitz, a number of incendiary bombs were successfully dealt with by means of this useful bomb-trap.

Sprayed Asbestos Gives Fire Protection

A material used for some time for the internal lining of high-class rolling stock now has an important application in connection with A.R.P. purposes. It is a waterproof, weatherproof, and fire-resisting board, manufactured in sheets 10 ft. by 5 ft. (2 mm. thick). It is strong, easy to work, and can be used to replace glass where this is lost or where it would be dangerous to leave it.

The same manufacturers have also perfected a compound known as "Sprayed Limpet Asbestos." This can be applied to steel or concrete, and one of its important uses in A.R.P. is in its application to the underside of roofs (or for that matter to the walls) in order to prevent condensation—a trouble which has been found in many shelters even where they are otherwise quite satisfactory. This same substance can be applied to structural steel work in order to considerably limit the tendency to collapse when the temperature of the steelwork is raised to a critical point through fire.

Industry Concentration Scheme to Provide 800,000 War Workers

(Continued from page 11)

that of four other concerns in two factories. As a result three factories are released completely in two towns where the space is most urgently needed.

Problems of the Pottery and Carpet Industries

Certain industries continue to present very special difficulties. In the pottery industry there are three problems. Only thirteen of the sixty or seventy firms are on a large scale but the small firms represent complete sections of the industry whose work is not done by the large potteries. Already, production has been shrunk due to the Limitation of Supplies Order. At the same time, there is an acute demand for the skilled pottery workers for certain work in war industries. The problem is to concentrate with only a minimum amount of labour available and yet to save all sections of the industry.

The Pottery Industry Employers' Federation is now considering proposals that a central fund shall be promoted for paying compensation to firms closed down. At the same time the principle of voluntary co-operation still stands for firms who care to adopt it. So that each firm in the Potteries has to make up its mind (a) as to whether it will come in on the Federation's compensation scheme and (b) whether it will go into a voluntary scheme either as a nucleus or as a closed firm.

The carpet industry offers a further series of special difficulties. Although two firms may be making the same type of Axminster carpet, it is probably impossible for one to take over the design manufactured by the other without expensive alteration to the loom concerned. On the other hand, three firms do two-thirds of the output of carpets in the Midlands and the south.

Concentration Without Absorption?

How are small firms to attain concentration without absorption?

Finally, most carpet firms are working full time, but even 75 per cent. of that time is employed on Government orders and export business.

In fact, I believe that a firm running full, even if part of its work be on export and service orders, has an extremely good chance of qualifying at once as a nucleus firm. It is true that it may be necessary to sacrifice some export or service business in order to undertake work for the home market. But where the plant has obviously been organised for long runs into which the quota for the home market can be dovetailed, it will have a strong case for recommendation as a nucleus firm even without adding to its work on quota goods.

Perhaps the cutlery industry is the

most difficult of all to concentrate owing to its complex construction. Here one branch, the manufacture of razor blades, has easily lent itself to concentration. In the case of other branches of the industry it may be that the idea will have to be dropped.

Meantime, there are whole industries where the reluctance of smaller houses to concentrate is such that scarcely any plans have been brought to finality. My advice to those industries is to go ahead with their plans immediately and to complete them at the earliest possible moment after the closing date for the submission of

voluntary schemes. In such a case, they will at least be able to present the Board of Trade officials with cut and dried schemes which can be fitted into any general plan. Failing this, I can see some excellently run concerns facing extremely great sacrifices from the very nature of a compulsory concentration scheme devised partly or in whole by Government officials.

It should be emphasised that the best thing a small concern can do is to arrange every detail of a collaboration with one or more other small firms in their industry, even if this entails a closing down of its production. It is obviously much more advantageous to co-operate with a small firm than with a large one, particularly from the point of view of post war production and selling. C.C.

Seven "Concentration" Questions Answered

(1) *Must a firm running full time, but not on quota goods, be concentrated?*

Suppose a concern in an industry under a Limitation of Supply Order is working 25 per cent. of its time on quota goods and 75 per cent. in non-quota goods, as it cannot qualify for a certificate as a nucleus firm under these circumstances; but if it can concentrate by taking any quota production of another firm or firms in a reasonable amount, the Board of Trade will give it the benefit of nucleus status.

(2) *What does the B.O.T. mean by "working full"?*

In answer to my inquiries on this subject, the B.O.T. assures me that one shift may be regarded as "full" if it is the practice of the industry to work only one shift. On the other hand, if it is the practice of the industry to work a double shift, the firm will not be regarded as "working full" unless the plant is, in fact, on two shifts.

(3) *Are the women's clothing industries to be concentrated?*

In the case of hosiery, yes. In the case of mantles and costumes, no. There are so many small firms in these industries that it would be impossible for them to provide any useful amount of factory space.

(4) *Why is the cotton industry alone allowed to combine spread-over with concentration?*

This report is due to misconception on the part of an official. Neither in the spinning nor the weaving end of the cotton industry will firms be allowed to use a limited number of spindles or looms in any factory. Any number of firms may concentrate their production in one factory, but that factory must be working full, i.e. every foot of floor space and every machine must be in use, and the full force must be in

employment. In this industry one shift qualifies as "working full."

(5) *Are the Trade Unions making difficulties?*

So far no serious difficulties have arisen with the trade unions. In fact, the representatives of the unions attend all meetings of the B.O.T. with industrial associations on concentration. Further, the Ministry of Labour consults with the trade unions concerned on all labour questions arising. Finally, the timing of actual steps in concentration is arranged on the advice of the Ministry of Labour as to when it will be possible to transfer workers from closed-up factories to war factories without delay or hardship.

(6) *How will the trade mark of a closed-up firm be guarded?*

The ideal arrangement is for the nucleus firm to arrange to manufacture on behalf of the closed-up firm under the latter's trade mark, but here legal difficulty arises. Technically, if a firm ceases to manufacture under its own trade mark it may not be able to resume the use of that trade mark if the break in production extends over several years. Clearly some special legislation will be required to deal with this situation. It is up to the industries concerned to press for this legislation, otherwise they won't get it.

(7) *What taxation will closed-up business bear?*

The closed-up business will simply have changed from a producing and selling concern to a selling concern. Although its identity as a business will continue it will only be taxed on the profits which it makes through selling goods manufactured for it by the nucleus firm. If the closed-up firm is bearing the cost of maintenance of its factory, i.e. standing overheads, this must obviously be regarded as a part of its expenses. C.C.

Business Guide to War-Time Law

By JOHN BURKE, Barrister-at-Law

Editor: *Loose-Leaf War Legislation;*

Encyclopædia of War Damage and Compensation

"I am swamped by this flood of special war-time Rules and Regulations," is a familiar phrase in readers' letters to the Editor. So he has asked one of the leading authorities on business law to digest and explain briefly every important Act, Order or Regulation coming into operation during the current month.

The notes which follow cover the period from April 1st, 1941. They are arranged in alphabetical order and numbered. It is intended in subsequent issues to include a cumulative index to earlier notes.

The references in these notes, e.g. S.R. & O. 1941 No. 539, are references to the Statutory Rules and Orders of 1941 published by the Stationery Office.

1. Affidavits and Oaths Abroad

United States consuls in Bulgaria, Hungary and Roumania can administer oaths and take affidavits for use in the United Kingdom; S.R. & O. 1941 No. 549.

2. Export of Goods

All the orders relating to the control of exports have been consolidated by the Export of Goods (Control) (No. 19) Order 1941 (S.R. & O. 1941 No. 630).

3. Finance Regulations

Acquisition of securities: a new vesting order has been made vesting in the Treasury a further list of American securities (S.R. & O. 1941 No. 520).

Bearer securities: no bond, share warrant or other document of title to a security may now be altered so as to convert it into a bearer security without Treasury permission; S.R. & O. 1941 No. 474, para. 1, amending r. 3B of the Defence (Finance) Regulations, 1939.

Isle of Man: S.R. & O. 1941 No. 475.

Sterling Area: Where goods are exported for sale from the sterling area there must be no undue delay in securing the remittance to the sterling area of the proceeds of sale. If payment has not been obtained within six months of the time of export or such other period as the Treasury allow, a person entitled to sell or procure the sale of the goods is liable to penalties and if the goods have not been sold the Treasury may make arrangements to sell them or to assign the goods to the Treasury. If they are so assigned the Treasury may pay the person assigning the goods such sum as the Treasury think fit; S.R. & O. 1941 No. 474, para. 2, amending r. 5B of the Defence (Finance) Regulations, 1939.

The "sterling area" now includes the United Kingdom and the Isle of Man; any Dominion and any other part of H.M. dominions outside the British Isles except Canada, Newfoundland and Hong Kong; mandated territories; British protectorates and protected states; Egypt; Anglo-Egyptian Sudan; Belgian Congo and Ruanda-Urundi; French Equatorial Africa; Cameroons under French mandate; French Oceania; French Establishments in India; Iceland and Faroe Islands. Iraq, which was formerly in the sterling area, is no longer so. (S.R. & O. 1941 No. 632).

4. Fire Watching

Occupiers of business premises are under an obligation to make proper arrangements (which may be joint arrangements) for securing that their premises are covered by an adequate fire watching service operating 24 hours a day (S.R. & O. 1941 Nos. 68, 69). Male British subjects between the ages pre-

scribed for the particular district working in business premises are under an obligation to do the fire watching duties which have been allotted to them unless they are exempt as Home Guards, Civil Defence Volunteers, on medical grounds or on grounds of exceptional hardship. (S.R. & O. 1941 Nos. 68, 69).

If a compulsory order has been made all male British subjects resident in a district are liable to be enrolled for fire watching duties in that district unless exempt as mentioned above but the obligation to do duty at business premises takes priority over the obligation to do residential fire watching (S.R. & O. 1941 Nos. 68, 70).

In the City of London all male British subjects between the ages of 18 and 60 who work in the city are liable to be enrolled to do fire watching in the city as if they were resident in the city. This duty takes the place of the two preceding duties (S.R. & O. 1941 No. 538).

See further the Pamphlet "Fire Watching," price 6d.

5. Food

Bacon: licensing of producers, Northern Ireland; S.R. & O. 1941 No. 461.

Cheese: prices; S.R. & O. 1941 No. 563.

Eggs: imported, prices; S.R. & O. 1941 No. 570.

Fish: canned salmon, prices; S.R. & O. 1941 No. 562; imported canned pilchards and herrings, prices; S.R. & O. 1941 No. 502.

Flour: control of mills; S.R. & O. 1941 No. 463, 512; prices; Nos. 462, 511, 533.

Fruit and Vegetables: canned vegetables; S.R. & O. 1941 No. 605; soft fruit, prices; No. 607; tomatoes, imported, prices; No. 489.

Glucose: prices; S.R. & O. 1941 No. 510.

Jam, Marmalade and Preserved Fruit: licensing and control; S.R. & O. 1941 No. 591.

Milk: National Milk Scheme; S.R. & O. 1941 No. 541; restriction of sale; No. 503.

Nuts: nut kernels, control and prices; S.R. & O. 1941 No. 534.

Oats: control and prices; S.R. & O. 1941 No. 470; oat products; Nos. 483, 524, 584.

Potatoes: crop control; S.R. & O. 1941 No. 559, 606; marketing scheme; No. 472.

Poultry: prices; S.R. & O. 1941 No. 597.

Rice: control; S.R. & O. 1941 No. 501; prices; No. 464.

Wheat: home grown, control; S.R. & O. 1941 Nos. 484; directions; No. 572; general licence; No. 571; milled wheaten substances restriction; No. 467; prices No. 466.

6. Gas Supply

Gas undertakings suffering war damage are relieved of their obligation to supply gas of declared calorific value; S.R. & O. 1941 No. 473.

7. Industrial Records and Information

Information, estimates and returns are to be furnished to the person mentioned in any notice issued by the government department concerned; S.R. & O. 1941 No. 583.

8. Limitation of Supplies

General licences have been granted for the supply of abdominal belts, surgical elastic stockings, etc., earthenware for nursing purposes (S.R. & O. 1941 Nos. 320, 554); sports goods, including gaming machines but excluding apparel (No. 366); replacement of war damaged goods; buckets (Nos. 447, 555); supply to Royal Naval and Royal Marine Sports Control Board and Royal Naval War Amenities Fund (No. 481); supply to British Broadcasting Corporation (No. 486); supply of cutlery, etc. certified by factory inspector as essential (No. 568); military band instruments (No. 587); as to the computation of value of children's wear during May, see No. 600.

9. Limitation of Supplies (Woven Textiles)

For general licences see S.R. & O. 1941 Nos. 460, 621.

10. National Service and Civil Defence

The National Service Act, 1941, renders every person who is liable to be called up for military service also liable to be called up for service in the Civil Defence forces. Under the proclamations now in force this applies to every male British subject in Great Britain who has attained the age of 18 and who has not attained the age of 41.

A conscientious objector who has been registered unconditionally in the register of conscientious objectors is exempt, but other conscientious objectors are not; and there are some other exemptions which do not concern readers of this page.

A person liable to be called up is entitled to apply for a postponement of call up on the ground that he will suffer exceptional hardship if postponement is not granted. Applications are granted under three heads (1) domestic position; (2) business responsibilities and interests; (3) individual circumstances. The hardship must be suffered by the person being called up and not by his employer. Applications must be made to a Military Service (Hardship) Committee. If an employer desires to retain the services of an employee on the ground that he is engaged in work of national importance he must apply to the Government Department concerned with that particular type of work. These matters are all dealt with in a pamphlet entitled, "Hardship and Military Service," by Ralph C. Yablon, price 6d. net.

A person who is called up for service in a civil defence force is entitled, at the termination of his service, to be reinstated by his employer in his former employment in the same way as a person called up for military service.

11. Personal Injuries in Air Raids

A new Personal Injuries (Civilians) Scheme 1941 has been issued (S.R. & O. 1941 No. 226) which operates as from December 24, 1941. Under this scheme temporary injury allowances and, in the case of permanent injuries, pensions and family allowances are paid by the Minister of Pensions to civil defence volunteers and to "gainfully occupied persons," i.e. persons wholly or substantially dependent on their work for a livelihood or who through temporarily unemployed are normally so dependent. These classes are paid at the higher rate, in the case of civil defence volunteers if they are injured in the course of their duties and in the case

of the others if they are injured by enemy action. Persons not gainfully employed also receive compensation but on a lower scale.

A person who is entitled to compensation under the scheme is not entitled to compensation or damages at common law or under the Employer's Liability Act in respect of an injury covered by the scheme (Personal Injuries Act, 1939, s. 3). If under the terms of his employment a person is entitled to sick pay from his employer, the employer is not bound to pay him more than the difference between his sick pay and the amount he gets under the scheme (s. 4). An employer must give to the Minister of Pensions any information required as to the earnings of a person employed by him (s. 5). The compensation under the scheme does not affect any rights under insurance policies, superannuation or pension schemes.

The procedure for making claims is contained in S.R. & O. 1941 No. 578.

12. Petroleum

The disposal, acquisition and use of petroleum, petroleum products and benzole is now regulated by the Petroleum Order, 1941 (S.R. & O. 1941 No. 546).

13. Public Utility Undertakings

Undertakings for the supply of electricity; canal, inland navigation, water transport, dock, harbour or pier undertakings; railways which have not been taken over by the Minister of Transport; and light railways (but not tramways) are forbidden to publish copies of their accounts (S.R. & O. 1941 Nos. 452, 485).

14. Purchase Tax

Wholesale merchants and manufacturers registered under the Finance (No. 2) Act, 1940, s. 25 are required under S.R. & O. 1940 No. 2194, reg. 10 to make returns of the amount of tax for which they are accountable. The returns for the future are to cover the period March 1 to June 30, 1941; and thereafter the periods July 1 to September 30; October 1 to December 31; January 1 to March 31; April 1 to June 30 in every year. The returns must be furnished to the collector of Customs and Excise not later than the last day of the month following the expiration of the period in respect of which the return is due (S.R. & O. 1941 No. 539).

15. Railways

Demurrage charges S.R. & O. 1941 No. 487.

16. Raw Materials, Manufactures and Commodities

Aluminium, segregation of scrap; S.R. & O. 1941 No. 522.

Bulbs: control; S.R. & O. 1941 No. 517.

Bearings, Ball and Roller: control; S.R. & O. 1941 No. 550.

Machinery, Plant and Appliances: S.R. & O. 1941 No. 516.

Mercury: S.R. & O. 1941 No. 588.

Timber: S.R. & O. 1941 No. 579 (transfer of functions of Forestry Commissions to Ministry of Supply).

Tins and Cans: control; S.R. & O. 1941 No. 561.

Wool: control; S.R. & O. 1941 No. 558.

Paper: control; S.R. & O. 1941 No. 528 (restricts the use of paper for advertising, packing and the manufacture of fancy goods; does not apply to export).

17. Summer Time

From May 4 to August 10, 1941, the clock is two hours in advance of Greenwich time; for the remainder of the year it is one hour in advance of Greenwich time. In calculating overtime payment of agricultural workers and in contracts for the delivery of milk the time is to be taken as one hour in advance of Greenwich time unless the parties otherwise agree. S.R. & O. 1941 No. 476.

18. Trading with the Enemy.

Black list: The Board of Trade "black list" of specified persons is now consolidated by S.R. & O. 1941 No. 532.

Enemy Territory: Hungary is now to be treated as enemy territory; S.R. & O. 1941 No. 495; so are Yugoslavia; No. 543; and the mainland of Greece; No. 613.

19. War Damage and Compensation

The War Damage Act, 1941, provides for paying compensation for certain classes of war damage. Only the briefest outline can be given here.

Part I of the Act deals with land, buildings and fixed plant and machinery. Contributions, collected by the Inland Revenue, based on the Schedule A value or if there is no Schedule A value, the rateable value, are to be paid by five annual instalments.

If the property suffers war damage between September 3, 1939 and August 31, 1941, compensation will be paid by the War Damage Commission in the form of a cost of works payment for the cost of repair or a value payment if the damage amounts to a total loss. In addition, a payment will be made for temporary works. The cost of works payment and the temporary works payment are made on completion of the repairs. The value payment is generally to be made after the war with interest at 2½% per annum, but it may be paid immediately if it is desirable to do so in furtherance of the war effort (S.R. & O. 1941 No. 588). An advance can be obtained up to £800 for re-housing and an advance up to £800 for re-starting a business, by application to the Regional Officer of the War Damage Commission (S.R. & O. 1941 No. 569).

Notification of the occurrence of war damage must be given to a Regional Officer of the War Damage Commission within 30 days of its occurrence. Claims for cost of works payments and temporary works payments must be made within 30 days of the receipt of the claims forms or the completion of the work, whichever is later. Claims for value payments must be made within 6 months of the receipt of the claims forms (S.R. & O. 1941 No. 569). Forms of notification and applications for advances can be obtained from the offices of the local authority.

Under Part II of the Act, the Board of Trade have established two schemes for the insurance of goods against war damage. These are the business scheme for the insurance of goods (other than stock-in-trade insurable under the Commodity Insurance scheme; see para. 20 below) and the private chattels scheme for the insurance of furniture and other personal property.

The business scheme came into operation on April 17, 1941, and the first policy should be taken out before May 17. The forms of policy and the premiums are prescribed by S.R. & O. 1941 No. 450.

The private chattels scheme came into force on May 1, 1941 and a policy should be taken out by May 31. The form of policy and the premium are prescribed by S.R. & O. 1941 No. 451.

In addition to the above there is a free insurance scheme under which the Board of Trade will pay compensation without insurance to a householder up to £200. If he has a wife living with him the amount is £300 and an extra £25 is paid for each child under 16. Persons other than householders may be paid up to £50.

All the foregoing payments are to be made after the war except (1) advance payments may be made under the business scheme if expedient in the public interest or if the claim does not exceed £100; (2)

advance payments may be made under the private chattels scheme and under the free insurance scheme if necessary to avoid undue hardship or if the claim does not exceed £25.

Part III of the Act amends the commodity insurance scheme established under the War Risks Insurance Act, 1939.

Mutual schemes for insurance against war damage are severely restricted as from April 17, 1941 (S.R. & O. 1941 No. 500).

The headquarters of the War Damage Commission are at Devonshire House, Mayfair Place, Piccadilly, London, W.1.

20. War Risks Insurance

The commodity insurance scheme operated by the Board of Trade under the War Risks Insurance Act, 1939 has been amended by the War Damage Act, 1941, so as to bring it into line with the insurance schemes (see para. 19 above) under that Act.

The commodity insurance scheme is for the insurance of goods in the United Kingdom held by sellers or suppliers of goods as stock-in-trade. Insurance is compulsory on the part of owners of stocks whose value exceeds £1,000 (S.R. & O. 1940 No. 785), or in the case of foodstuffs, £200 (S.R. & O. 1940 No. 1143). The risks insured against are "King's enemy risks," but damage from King's enemy risks is now identical with war damage under the War Damage Act, 1941 (War Damage Act, 1941, s. 78 and S.R. & O. 1941 No. 491, para. 4).

A new form of commodity insurance policy has been prescribed (S.R. & O. 1941 No. 491, para. 1).

Certain goods are not insurable under the scheme. These are crops, livestock and agricultural products on a farm; goods on hire purchase where payment is by not less than four instalments spread out over a period of not less than six months; removable fixtures (S.R. & O. 1941 No. 491, para. 2). The goods so excluded are insurable under the business scheme or the private chattels scheme under the War Damage Act, 1941; see para. 19 above.

Certain classes of goods which are not easily destroyed or are not readily saleable in war conditions were formerly also excluded from the scheme and were not insurable. These goods are now exempted from compulsory insurance but may be insured voluntarily (S.R. & O. 1941 No. 491, para. 3).

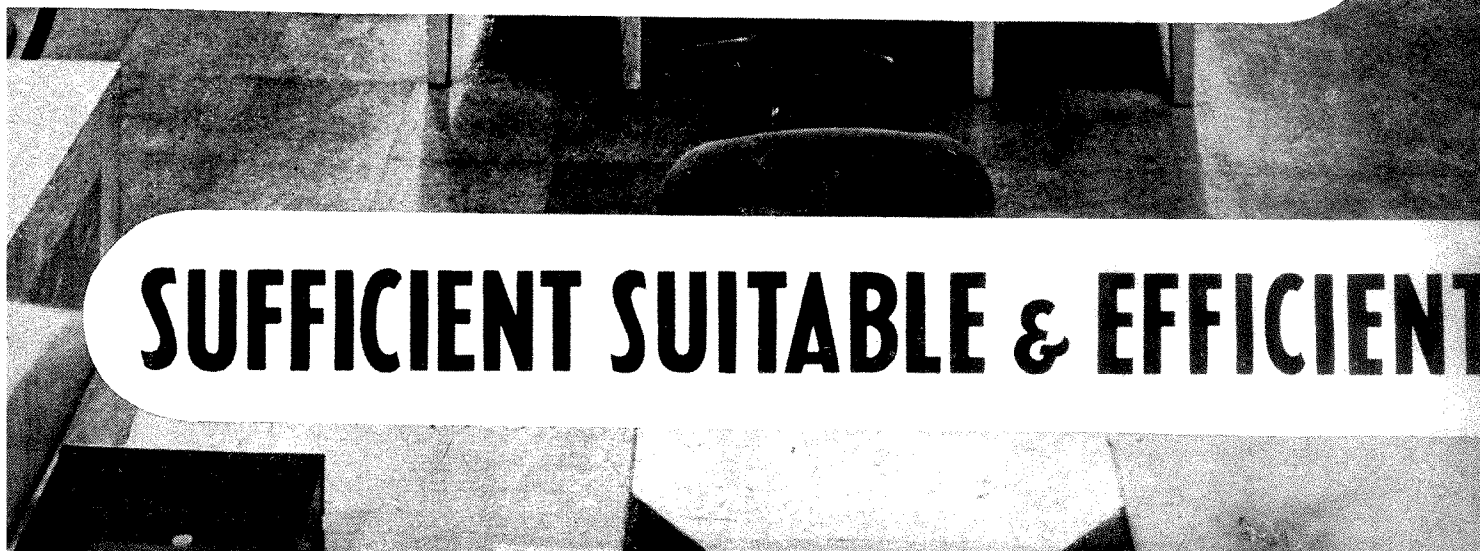
Sellers or suppliers of goods may now insure stocks which they do not own but in which they have an interest arising in the course of business. Any person may insure stocks which he does not own but which are in his possession (otherwise than under a hire-purchase agreement) or over which he has a charge or lien (War Damage Act, 1941 s. 74).

21. War Zone Courts

War Zone Courts have been established throughout England and Wales (S.R. & O. 1941 No. 564), and Scotland (No. 518). These courts only function when the ordinary courts cannot function properly owing to invasion.



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TREND OF TRADE

Shop Sales Reflect Further Population Movement

says CECIL CHISHOLM, M.A.,
Business Consultant

SURELY the D.O.T. reached the limit in disingenuous statement with "exports 99 per cent. of last year." With average retail costs up 27 per cent. and overheads where they are, it is obvious that the volume of exports fell by around 30 per cent.

While there is no harm in using money values for a press statement, it is utterly misleading to gloat over the maintenance of the level of exports, which is non-existent. Why give the public a completely incorrect idea of the export situation and so minimise the difficulties of the export houses?

The fact is, that the difficulty of getting raw materials for export increases daily, particularly in textiles. In some cases the exporter is being cut to the same percentage of raw materials as the maker for the home market.

Non-Food Sales Are Now Down Around 40%

Shop sales for March show a slight fall below the February level, at -2.1 of last year. This is certainly more satisfactory than the figure for March 1940, which showed a rise of 12.8 per cent.

The rise by around 27 per cent. in the cost of living, reduces the volume of sales in March by that amount, giving a fall in volume of 29.1 per cent. To this price rise must be added the Purchase Tax of 17½ per cent. to 33½ per cent., now in full operation. Probably the fall in sales is over 40 per cent. So we have only another 10 per cent. to go before we get the situation in hand.

Food sales are certainly under complete control, thanks to rationing of both consumer and raw material

supplies. For the first time in my recollection, the fall in food sales is identical with that for other merchandise. Obviously this equality of movement must be a pure coincidence: yet, it does seem to show that the control of total sales in textiles, hardware and a wide variety of lines is under some degree of control.

Variations in Area Buying Prove Stronger Than Ever

The value of food sales rose in every one of the provincial areas, rising to 6 per cent. in Scotland; in London there was a fall of 7.8 per cent. and of 10.6 per cent in the suburbs.

Variations in the sale of other goods was more marked than ever. They range from a fall of 19.3 per cent. in London to a rise of 16.2 per cent. in Scotland. The sale of household piece goods was up by 21.2 per cent., of dress piece goods by 27.6 per cent. (This probably means a fall of only 20 per cent., allowing for the Purchase Tax).

Footwear sales wobbled astonishingly. There was a rise of 32.8 per cent. in Scotland, a fall of 16.6 per cent. in London.

North-East pays 64.9% More For Piece Goods

Furnishing goods continue in the doldrums again with the exception of Scotland (5 per cent. up). The sale of hardware goods shows precisely the same variations as piece goods, but the sale of fancy goods are maintained throughout the country outside London and its suburbs.

Sales of dress piece goods are up by no less than 64.9 per cent. in the North-east. The figure is extraordinary because it is not paralleled in any

other district in the country, including Scotland. It suggests the wage levels in the North-east must be as high as those in any part of the country.

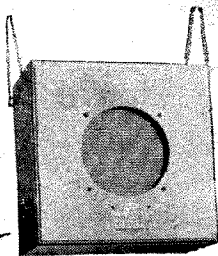
Control of Storage CAN Improve Situation

THE new register of factory and storage premises was overdue, like the appointment of Sir Thomas Barlow and Mr. Phillip Water as factory and storage Controllers respectively. Only with complete registration not merely of floor space, but of what is happening on that floor space, can the best use of available factory space be made with a minimum interruption of normal business. At the moment there are far too many parts of small factories being used for the manufacture of small parts, for storage, when other and more suitable accommodation is available in the area concerned.

Tobacco Sales Are Up in War-time!

Many manufacturers working for the home consumer trades are concerned by the inequalities of supplies which they are often unable to avoid. The map published in last month's BUSINESS showing the results of evacuation since September, 1939, may be of some assistance to some of them. The worst problem arises in the children's clothing trade. As most evacuees are children, the shortages of such clothing in evacuee areas are becoming extremely serious. Many shops in these areas are without a single vital garment in the popular children's sizes.

The greater problem in the whole supply situation is, of course, tobacco. In the first year of the war the tobacco industry actually released and sold 20% more cigarettes than in the previous year. The result is that the present cut of 10% still leaves the sale of cigarettes far beyond what it should be in war time. Whatever stocks the tobacco manufacturers hold it is clear that they are occupying too much shipping space in maintaining the turnover above the pre-war level. Here is one case where a little more control might almost be salutary.



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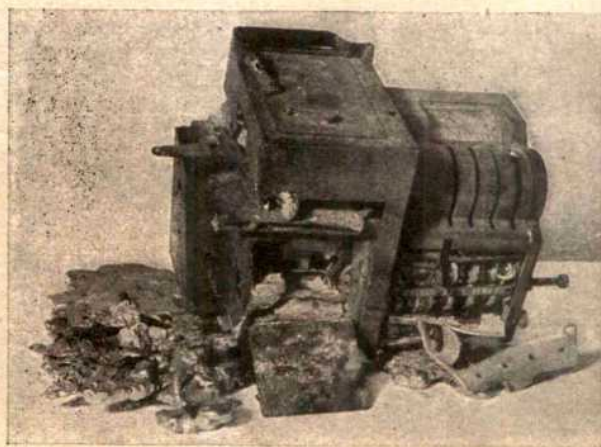


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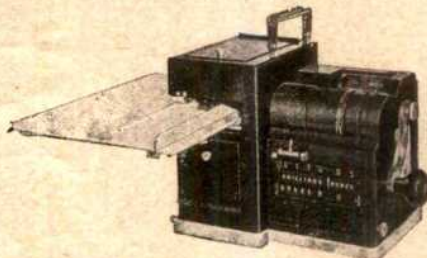
The last service rendered by the "Universal" Machine shown above was to secure the Post Office refund of £28 which would have been lost through fire had the money been spent on stamps. In numerous other instances of fire or damage, individual balances up to £120 have been recovered.

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One of our representatives will be pleased to call and give you full particulars of this time, money and labour saving equipment. Our factory is mainly employed on work of vital national importance, so it is inevitable that delay in the delivery of our latest models will occur. An early record of your requirements will therefore prove advantageous.



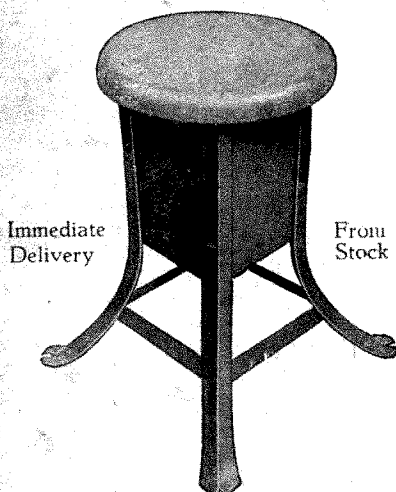
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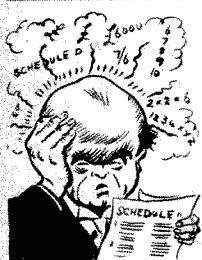
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PITMAN'S FOR BOOKS ON INCOME TAX

How to Solve the Office War-Time Labour Problem . . .

Secure your Typists and Learners Straight from School

THE problem of securing office staff has been solved by one large firm by informing a number of elementary schools and business training colleges in the suburbs that there are frequent vacancies for copy typists and learners on the staff. Pupils of the schools coming with a recommendation from their teachers are assured of a good post, with excellent chances of promotion. Following the successful progress of one or two girls from a school, the teachers saw that only the most promising pupils were introduced.

Experienced shorthand-typists presented a different problem. Central Labour Exchanges were unable to help but it was found that the suburban

ones usually have an adequate supply of efficient girls on their books. These sources of staff were regularly advised of coming staff requirements and the usual red-tape of Exchanges swept aside to see that the most satisfactory types of girls were recommended.

Similar methods have also been employed for securing male staff and salesmen. Since an unemployed man has to register where he lives, he is usually only in contact with a suburban Labour Exchange, whereas the vacant jobs are, in most cases, with City firms who notify their local Exchange of their requirements, information of which is rarely passed on to outlying branches.

Making the Job Easy for the Bevin Girl

(Concluded from page 8)

particularly acute in that field it is vitally necessary to ensure so far as is practicable, that operations are split in such a way that the tasks assigned to the higher grades of skilled labour are appropriate to their skill and training.

It may be argued that the double or triple handling of a piece due to the splitting of operations means an increase in the number of men hours taken to handle a given amount of product. In some cases this may be true, but it must be regarded as practicable to do so if a larger over-all output can be achieved to the absorption of additional labour of a lower degree of training and experience.

Machinery of a low grade type unsuitable for finishing operations can be used for roughing and semi-finishing

operations using much heavier feeds than would be practicable on machines which must be maintained in a suitable condition for carrying out precision finishing operations.

Finding the Tool Setters

There is an inevitable sequel to this. More, and not less, labour is required in the tool room when operations have been so simplified for women. Where are the skilled tool setters to be found?

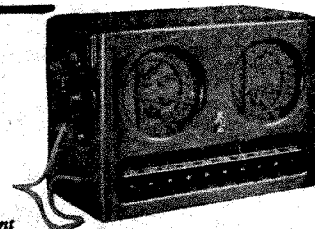
Engineers first answered that question, if I recollect rightly, in the last war. At that time they were already taking semi-skilled workers from the lines and giving them special training in the setting of engineering tools. Obviously, these men require skilled assistance for some time after their training.

This subject is so important that I shall be giving further experience on it in an early issue.

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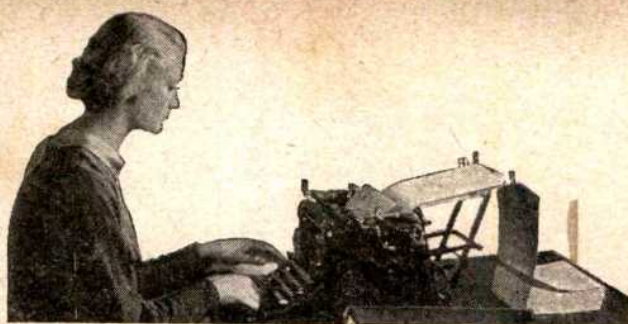
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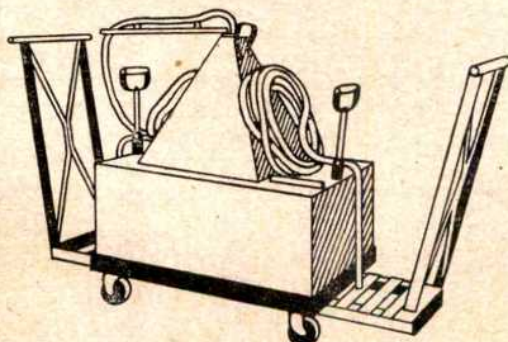
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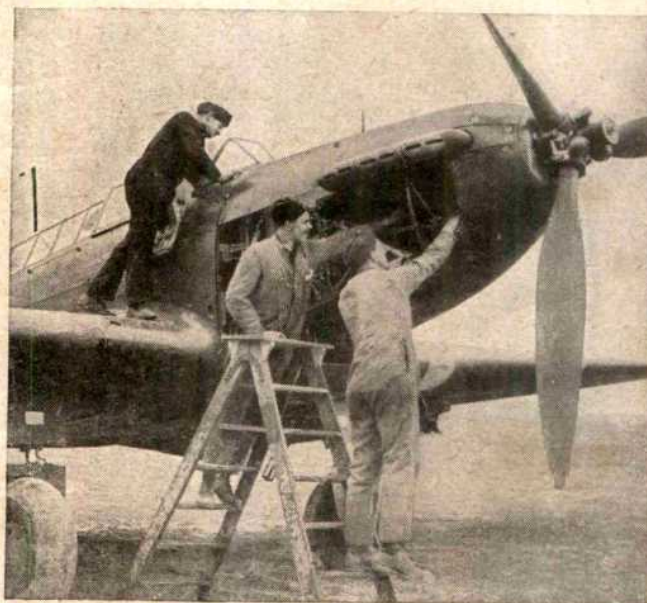
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Your staff will work better, be healthier,
look smarter in protective clothing that
doesn't get smaller when it's washed

YOUR staff is probably doing just as important work these days as that of the fitters and riggers of the R.A.F. Like them, they have to be able to move fast, to use their arms freely, to bend quickly, and to breathe without restriction. They too need to be efficiently protected from grease, dirt and oil in the shops or workrooms.

Overalls that *shrink* neither give workers efficient protection nor allow them to do their jobs efficiently.

This fact has been recognized by the War Office. They specify a standard of shrinkage control

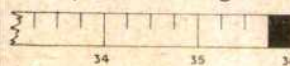
for overall cloths and cotton service uniforms worn by the Forces. This standard is a very high one. It allows for no more than $\frac{1}{4}$ of 1% shrinkage in length or 2% in width.

The diagrams below show the wide margin of difference between many so-called shrunk overall cloths and "Rigmel"-Shrunk. They emphasize, too, the importance of getting "Rigmel"-Shrunk overall cloth when buying for factory staffs.

You will find your staff are healthier, look smarter, and work better, in overalls that don't shrink. And they are an economy because they need fewer repairs and replacements.

Why not see your suppliers about "Rigmel"-Shrunk cloth? Protective garments in it are also available through retail outlets for purchasers of small quantities.

Compare these diagrams



Overall cloth that is "Rigmel"-Shrunk won't shrink by more than a fraction of an inch in the yard.



Some so-called "shrunk," "fully-shrunk" and "guaranteed unshrinkable" overall cloths shrink by as much as 2 inches in a yard.



"Rigmel"-Shrunk

REGD

Laundry-tested
against Shrinkage

Advertisement of THE BRADFORD DYERS' ASSOCIATION LIMITED
LONDON · BRADFORD · MANCHESTER

A War-time Necessity for Every Business—

THE WAR DAMAGE ACT, 1941 vitally affects every business in the United Kingdom. It is essential to have available the actual text of the Act. But the Act by itself is of little use without the Rules and Orders made under it and it is only the latest of a series of Acts which deal with the effect of war damage on the rights of property owners.

The Loose-Leaf Encyclopædia of WAR DAMAGE & COMPENSATION

Edited by **JOHN BURKE**,
Barrister-at-Law.

Editor "Loose-Leaf War Legislation."
Assistant Managing Editor "Halsbury's
Laws of England" (Hailsham Edition)

is a complete collection of all the Acts, Rules and Orders relating to war damage and compensation. Full annotations to the Acts and Orders explain the meaning of the text and the relation of one Act to the others. A Preliminary Note to each group gives an invaluable general summary. A single comprehensive Index covers the whole subject.

The characteristic feature of war-time legislation is change. New orders are issued and amendments are made, sometimes by Parliament, more often by Government Departments and there is a constant need to keep up-to-date.

Always Kept Up-to-date for You

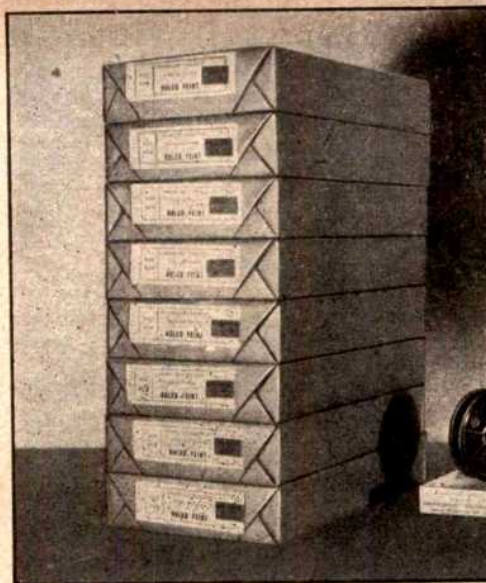
THE LOOSE-LEAF ENCYCLOPÆDIA OF WAR DAMAGE AND COMPENSATION is kept continuously up-to-date by the issue of loose-leaf Supplementary Parts with full instructions for collating them with the main work.

CONTENTS.

- I. War Risks Insurance.
- II. Landlord and Tenant (War Damage).
- III. Housing and Essential Buildings and Plant.
- IV. Compensation.
- V. War Damage.
- VI. Forms and Precedents.

This war-time necessity, which will save you worry and considerable expense, is only 20/- nett, including a substantial loose-leaf binder, or 21/- post free. Supplementary Parts, keeping it up-to-date, will not be more than 5/- each. Make sure of a copy by securing it to-day.

HAMISH HAMILTON (Law Books) LTD.
90 Great Russell Street, London, W.C.1



One small reel of film is all that is needed to provide a perfect record of 2,500 documents. The illustration shows the comparative space required for the original documents and their photographed duplicates.

Bombs may Destroy Your Important Business Records

*Space-saving Films Safeguard Blitz Losses and
Reduce Duplicate Storage Space by 99 per cent*

NOBODY'S records are safe now-a-days. Material losses can be compensated but loss of data can never be made up for.

The only way of making as sure as possible that valuable records are not lost by fire, theft or enemy action is to keep a duplicate set of records in another place.

But this, by ordinary methods, would mean very great expense for the amount of storage room necessary. Therefore it is expedient to look around for some way of keeping a duplicate set of all records without needing the same amount of space in some other place. There is such a method already in use; it is by photography on small size films. On an average, the amount of storage space required for the films is one per cent. of the space required for the original records.

The Camera Cannot Lie, Especially About Signatures

The making of these film copies is extremely simple. The originals are fed by hand into a machine called the "Recordak" by an unskilled operator who does not have to know the first thing about photography. They are automatically photographed during their passage round a revolving drum and are discharged into a receptacle in the same order.

Quite apart from the saving of space, however, just imagine the cost of copying all the important records of a firm by ordinary methods. Typists, who are, of course, skilled workers, would be typing all day long, day after day, copying one document at a time!

Perhaps the most important feature of this duplicating method, however, is the impossibility of error. With the

human element, no matter how efficient the typist, the risk of error by omission or by wrong copying is always present. The camera records exactly what is there—no more, no less. And it does what no typist can do—give an indisputable copy of signatures.

When reference has to be made to filmed copies, it is a simple matter to project them with the projector supplied for the purpose.

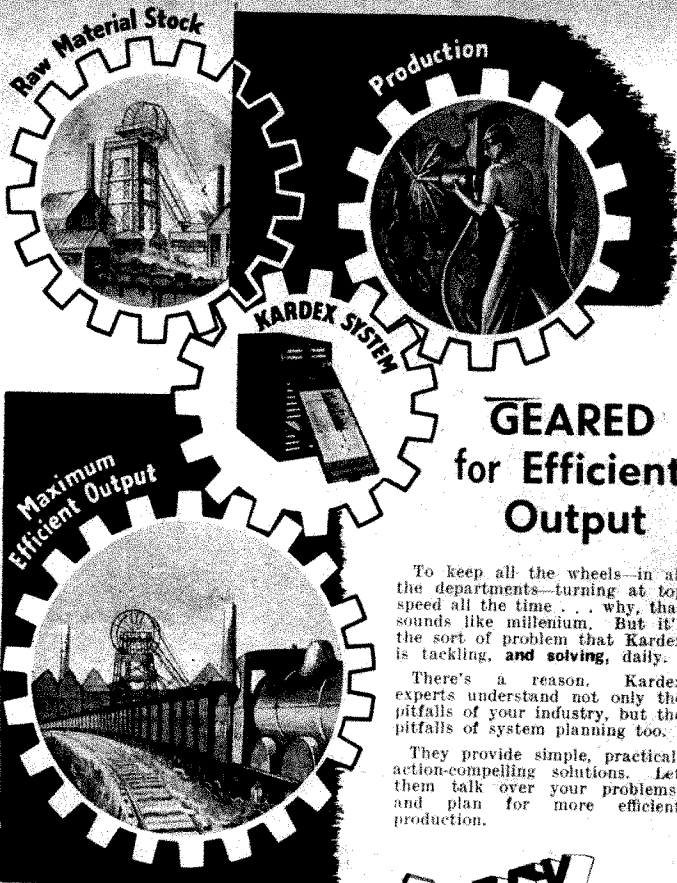
Photo Copying Eliminates Risk of Error

Filming documents has simplified the work of banks and clearing houses, and is applied to accounting systems in large commercial firms. Before the cheques are passed from one bank to another they are filmed, thus simplifying the work of balancing which often otherwise entails a vast amount of time spent tracing uncharged or lost cheques.

Filming can be used to speed up the execution of orders and reduce queries in ordinary commercial manufacturing and supplying firms. The customer's own original order form is used as the delivery note. Details of price, etc., are added to it, and it is photographed before being returned as a delivery note. This saves a great deal of copying, with its attendant risk of error.

Photography in the keeping of commercial records is not a new idea, but it is one which the difficulty of war-time trading—shortage of paper and labour, necessity of keeping records in two places for safety; and many other problems—is developing far more rapidly than normal conditions would have done.

It is an idea that has come to stay.



Write for Stock and Planning
Leaflets to Department 301.
KARDEX VISIBLE CONTROL SYSTEMS,
1 New Oxford Street, London, W.C.1.
Tel.: CHAncery 8888.



RADIO KARDEX, an interesting fireside magazine sent free on request.

**TIMING
THE
JOB**



Timing of jobs is an essential feature of production today. You are invited to ask for free copy of booklet 201 containing details of the speediest and the most efficient methods of securing accurate jobtime records and dealing with them.

Write, telephone or call:

**INTERNATIONAL TIME RECORDING
CO., LIMITED**

112 STRAND, W.C.2

TEMple Bar 5841

Head Office:

International Works, Beaver Lane, London, W.6

J517-4

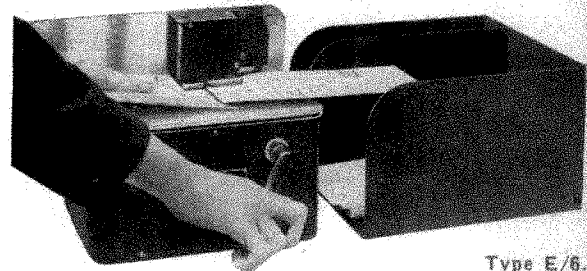
To Executives

*Gentlemen,
You do not tolerate inefficiency
and yet you probably permit
NOISE
the basic cause of inefficiency
in Office and Workshop.
BURGESS offer their unrivalled
Service in the solution of your
problem — free and without
obligation — Write now*

*Burgess Products Company Ltd.
Acoustical Engineers
Hinckley, Leics.*

THE "RAPID" LETTER OPENER

With Automatic Feed.



Type E/6.

British Made.

This machine certainly solves the problem of handling the morning mail quickly and efficiently. It can justify its installation within a very short time.

Price: £14 12s. 0d. including Purchase Tax Limited Quantity.

**INTERNATIONAL COIN
COUNTING MACHINE CO. LTD.**

COLLEGE ROAD,
CHESHUNT, HERTS.

Phone: WALTHAM CROSS 3364.

DON'T TAKE THE RISK

*of loss through
embezzlement by
employees*

It happens again and again—no system is proof against it. Pass on the burden of such loss to the "GENERAL," a company with Assets of £20,000,000. Enquiries are invited for individual or collective Fidelity Guarantees. The cost is small.

THE GENERAL

ACCIDENT FIRE AND LIFE
ASSURANCE CORPORATION,
LIMITED

Life & Fire Established 1837
Casualty 1885

Chief Offices—
General Buildings, Perth, Scotland
General Bldgs., Aldwych, London, W.C.2

WAXCRAFT TYPEWRITER CARBONS

The NEW non-smudge
CARBON PAPER



- Does not "tree" or crease.
- Sharper impression.
- Costs no more.
- Longer life.

FREE SAMPLES FROM

STANDARD OFFICE SUPPLIES CO.,

57 FARRINGTON ROAD,
LONDON, E.C. 1.

Phone: CHAncery 5561 (4 lines).

It is a National Duty to Keep Your Business Going

Use Bulletins to Maintain Contact with Old
Customers even if you have Nothing to Sell

Says E. SYMES BOND

Managing Director, The Vase Press Ltd.

IT seems to me that because the government is necessarily taking a great deal of the control of our businesses out of our hands, there is a tendency on the part of too many of us to feel that we can do nothing about the future of our own businesses.

The Government wishes that after the war employees should be reinstated in their jobs. Therefore, no employer has a right weakly to allow his business to lapse without an effort, and then to say he cannot reinstate men because his business was ruined by the war.

Bulletins, Not Letters, Give Best Results

Hence the particular value of such articles as that in the January issue of BUSINESS, about firms who will use war experience to boost their after-war business. This article told of a firm that has adopted a sort of "public relations" policy to keep contact with and to retain the goodwill of its many customers and prospects. This firm, among other things, has issued a monthly bulletin, not asking for business, but giving its customers interesting information about its activities.

It is difficult to publish a house journal of any pretensions in these days, but some sort of periodical contact with customers and a selection of the more important prospective cus-

tomers is essential. A letter is one way, but to write a series of letters on the same subject becomes formal under present conditions and is hardly the medium for telling stories of war-production or war difficulties.

A "bulletin," which is I suppose a slighter form of house journal, can tell the stories as though they were of public interest—which many of them are. I saw two recently, one published by a firm that has no stock whatever to offer its old customers—only a few spare parts, of which it is making the most.

It publishes photographs of the firm's representatives in their service uniforms, gives brief and cheerful accounts of its attempts and failures at obtaining supplies, and includes articles on suggestions to its readers as to how to overcome some of their war-time difficulties and how to interest new and unskilled female workers in the trade.

The other journal also concentrates more on ideas that may be helpful to the firm's old customers than on lamenting their loss of trade, and I know that both bulletins have created a very friendly feeling towards the publishers.

The whole secret of the preservation of goodwill and of the value of trade marks, trade connections and trade names, is to keep up some sort of regular contact with customers and prospective customers.

BLINDS

J. AVERY & CO., 81, Great Portland Street, W.1.
& CURTAINS

Speciality—

A PATENT BLACK OUT BLIND FOR FACTORIES

No Light Leakage at Top, Bottom or Sides.
Proper Ventilation.

AVERYS Est. 1834

Four Short Cuts to OFFICE EFFICIENCY AND ECONOMY

RATIONALISE YOUR TYPING STAFF

WITH the present difficulty of securing experienced office workers many misfits are bound to creep in an organisation and by their inefficiency cause considerable loss and interference. To many firms it is not worth while to introduce a fully organised central typing department or to make elaborate research and output standards.

A simple form of typist's report introduced by one firm has enabled the office manager to establish a basic system for utilising girls for the jobs for which they have the most ability. For two or three weeks each girl kept a rough daily record of her work under the headings of:—

- Letters dictated and typed. Full page. Half page. Less than half page.
- Inter office memos typed.
- Standard Letters typed.
- Form letters filled in.
- Envelopes addressed.
- Invoices typed.
- Telegrams, etc.
- Documents typed, number of pages.
- Tabulated work typed, number of pages.
- Miscellaneous work—itemised by hours.

Against each item the approximate time was recorded, and then they were consolidated in a Weekly Analysis of Typist's Output.

This analysis at once showed the time taken by each typist on various tasks and enabled certain jobs demanding considerable efficiency to be given to the ablest girls. Work of a less involved nature was given to less reliable girls. Within three months a system had been perfected which showed nearly 100 per cent. improve-

ment in output without increase of staff.

This simple output-record system can also be applied to other types of office work, to despatching and so on.

WATCH YOUR TYPEWRITER RIBBON COSTS

TYPEWRITER ribbons can form a very substantial item of office expenditure unless care is taken to encourage typists to conserve them as much as possible. The life of a ribbon varies from two to eight weeks, according to the amount of use made of it and also the size of the type face and condition of the platen, or rubber roller. A machine with pica type will get up to 50 per cent. greater use out of a ribbon than one with the smaller elite type. A smooth platen is also an important factor since it gives a better type impression than one badly worn, and so prevents rough wear of the ribbon.

Single-colour ribbons give at least 40 per cent. more wear than two-colour ribbons. The red, or emphasising, portion of a two-colour ribbon is often used only for the equivalent of ten lines during the whole life of the ribbon. With a single-colour ribbon capital letters and underscoring can be used for the purpose of emphasis equal to that of a red ribbon.

REVITALISE DRY RIBBONS

MORE typewriter ribbons are discarded because they are too dry than those which are actually worn out. Providing the fabric of the ribbon is still intact much of the former freshness can be regained by an application of oil. A piece of woollen cloth or a sponge, moistened with sweet, typewriter or sewing machine oil, and folded round the ribbon, which should be wound from one spool to another a few times, will be found to refresh the ribbon and give several more weeks' wear.

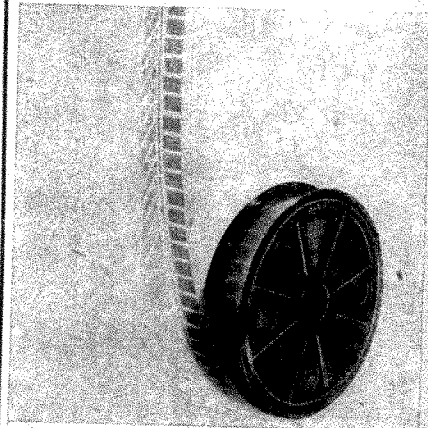
TO SAVE CALLING BACK

IF the man you want to see is out when you call, and the matter is one of importance and you have no time to wait for him, why not ask his secretary to let you use a dictating machine? You can then talk to him as if he were there, and before you leave, listen to your own voice to be sure that you have left no important point unsaid.

He will be more impressed and far more likely to get your story correctly than he would by any messages left with a third person.

ARP SAFEGUARD YOUR RECORDS

Reproduce all
your valuable records
on miniature film



THE WISE MAN takes full precautions to ensure that all the vital documents in his business are duplicated in such a way that in the event of the destruction of the originals, his business can still carry on without interruption.

KODAK COPYING SERVICE

Single documents, with maximum width of 10½ inches but unlimited length, can be reproduced on 16 mm. film at prices from 2 shillings per 100 facsimiles.

Bound ledgers, deeds and other documents up to 17 x 22 inches, can be reproduced on 35 mm. film at prices from 12 shillings per 100 facsimiles.

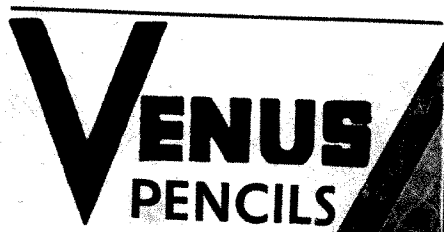
Ask the "Recordak" Division of Kodak Limited to quote you for your requirements at the following offices.

KODAK LTD.

"RECORDAK" DIVISION

ADELAIDE HOUSE, KING WILLIAM ST., LONDON, E.C.4

11 PETER ST., MANCHESTER, 2



VENUS PENCILS are incomparably smooth and long lasting, their standard of quality never varies.

MADE IN ENGLAND KNOWN THROUGHOUT THE WORLD.

If you have any difficulty in being supplied, write direct to the address below for sample, stating which degree you prefer.

VENUS PENCIL Co. Ltd., LONDON, E.5.

From 6d softest to 9d, hardest

FIRE FIGHTING

Recent events have shown the necessity of efficient fire fighting equipment in industrial concerns. If fire fighting is your difficulty, we can be of assistance to you.

Asbestos Outfit

This outfit, which gives protection to the front of the body, comprises Face Protector, Blanket Apron and long Gauntlets.

Complete in carrying satchel ... 57/6
Asbestos Blankets 6' x 6' in metal container 35/-
Asbestos Blankets 4' x 4' in satchel ... 19/6

Equipment for Works Brigades

As fire brigade specialists, we have helped and equipped many of the largest industrial concerns in the country. If you need advice of any kind we shall be pleased to place the benefit of our experience in this type of organisation at your disposal.

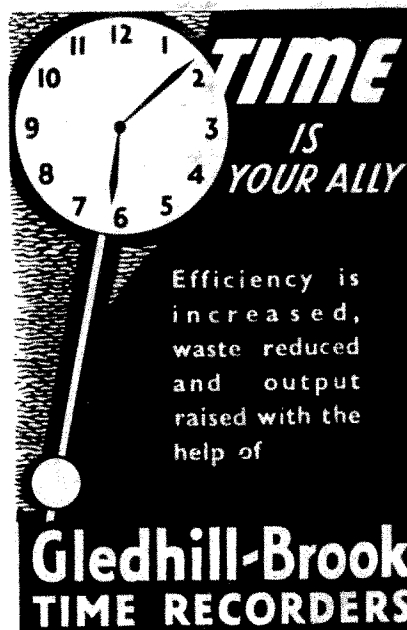
Fire Fittings and Hose

We are now in a position to give quick delivery of Gunmetal Fire Fittings, including Adaptors, Branchpipes, Nozzles, Breechings, Valves, Standpipes, etc. We shall be pleased to quote for your exact requirements.

BEATTIES of SOUTHGATE

Safety House, 11 Tudor Way,
London, N.14.

Palmers Green 6801/2.



TIME IS YOUR ALLY

Efficiency is increased, waste reduced and output raised with the help of

Gledhill-Brook TIME RECORDERS

Write for details of Equipment and Service:

GLEDHILL-BROOK TIME RECORDER LTD.
Dept. 38, Empire Works, Huddersfield.

CLASSIFIED ADVERTISEMENTS

RATE—2/6 a line (average 7 words to a line). Minimum 3 lines costing 7/6; each additional line or part of a line 2/6. Box No. counts as one line and is to be paid for; replies are forwarded free of charge; 2½% discount for 3 insertions, 5% for 6, 10% for 12. Payment with order for single insertion. Display panels 25/- per single column inch. Discounts as above. Special rate for "Appointments Wanted": 3 insertions for the price of 2.

OFFICE EQUIPMENT FOR SALE

"A Large Selection of Ex-Government and OTHER STEEL and WOOD OFFICE FURNITURE, INCLUDING FILING CABINETS, DESKS, CARD INDEX CABINETS, ETC. Also Plan Cabinets, NEW AND SECONDHAND, AT LOWEST PRICES.—WRITE FOR CATALOGUE, THE MISCELLANEOUS TRADING CO., LTD., 134/6 HIGH HOLBORN, W.C.1. HOLBORN 4894."

FOR SALE

3 Adrema Cabinets 3R size, 126 trays in each, 80,000 3R plates, used once only. 2 Hand Model Gestetners, also 1 R.K.L. Rotaprint Machine, recent number. Telephone: EUSTON 5135.

Brant Automatic Wages Cashier. Absolutely new. Complete with trays. First offer of £75 secures. Hawkes & Snow, Aylesbury House, Hookley Heath, Warwickshire.

TIME RECORDERS

Staff Time Checking and Job Costing Time Recorders (all makes) for quick cash sale, exceptional condition.—Write "Betarecol." Box 345, BUSINESS, Whitefriars House, Tallis Street, E.C.4.

WANTED

Office Furniture and Safes urgently wanted. Good prices paid. Send description DALE, 113 High Holborn, London, W.C.2. Tel. HOLBORN 2564.

It's the least you can do—

GIVE ONE PENNY EACH WEEK TO HELP THE RED CROSS CARE FOR THE WOUNDED

● Start a "Penny-a-week" scheme where you work. Send a postcard to the Lord Mayor of London, Mansion House, E.C.4, for full details. Red Cross thanks this Journal for the free gift of this announcement.

ABSENTEEISM and UNPUNCTUALITY

(Concluded from page 13)

transgressors. Generally the foreman is the best person to conduct these interviews, referring serious delinquents to higher authorities. Some firms arrange for the nurse to see all absentees on their return, as illness is so often given as a reason for being away. If the claim of illness is unjustified, she is the most likely person not to be deceived.

Some firms, where a bad habit of unpunctuality has grown up due to war conditions, have had surprisingly good results from a few weeks' "punctuality drive." The timekeepers lock the "In-Board" of the clocks at three minutes past the time of arrival, and all cards are put into a special basket and clipped—this clipping acts as a warning not to be late again that week.

Breaking a Bad Habit

Each week the foremen are sent details of all operatives who have been late twice or more, and the average of the records of their departments are compared with the records of the factory as a whole.

The immediate effect of such a drive is interesting. For example, in one important shop in an engineering works on urgent war production thirty per cent. of the operatives were unpunctual ten minutes or more, and seven per cent. of the whole were over half-an-hour late. During the punctuality drive only four per cent. of the operatives were even four minutes late.

But notice should be taken not only of bad time-keeping; appreciation should also be given to those who have struggled against great difficulties and maintained a high standard of attendance and punctuality. National emergencies call for many sacrifices; and by no means the least are those of the many workers who have overcome danger, discomfort and fatigue, and yet arrived on time and put in an honest day's work.

More Typewriters wanted

To Speed Up The War Effort

H.M. Stationery Office ask all owners of typewriters to offer any which can be spared for work of urgent National importance. Machines should be in good working order and not over 20 years old.

The Director of Supplies (S3E),

H.M. Stationery Office,
Princes Street, S.W.1.

State name of maker, model and whether you wish to sell or loan.

MONTREAL
TORONTO
WINNIPEG

GIBBONS KNOWS CANADA

J. J. GIBBONS LIMITED • ADVERTISING AGENTS

REGINA
CALGARY
EDMONTON
VANCOUVER

TAYLORS FOR ALL TYPEWRITERS

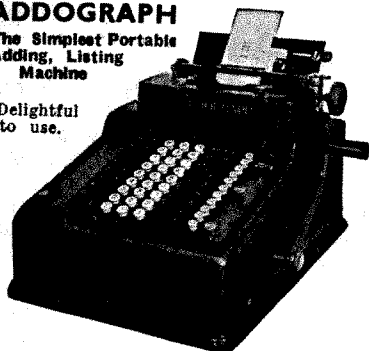
Cash Registers, Coin Changers, Wage Payers, Cashiers, Calculators, Time Recorders, and All Business Appliances, Adding Machines and Duplicators **HIRED AND REPAIRED**

SAVE TIME—HIRE AN ADDER FOR STOCKTAKING

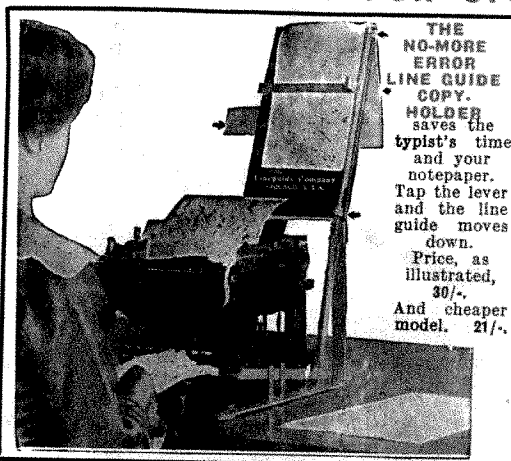
ADDOGRAPH

The Simplest Portable Adding, Listing Machine

Delightful to use.



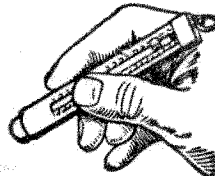
8 col. to add from 1d. to £9,999 19s. 11½d.
9 col. to add from 1d. to £99,999 19s. 11½d.
Hand and electric models with or without subtraction and wide paper carriages.
No Modern Office can afford to be without one.



THE NO-MORE ERROR LINE GUIDE COPY. HOLDER saves the typist's time and your notepaper. Tap the lever and the line guide moves down. Price, as illustrated, 30/-. And cheaper model, 21/-.



MAIL OPENED IN QUARTER TIME
busy office, no torn cheques, etc.
£2 2s. post free.



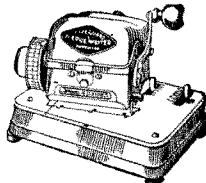
THIN EDGE ERASER

Acts like propeller pencil, always clean and sharp edged. Best quality nickel plated. 2/6. 2nd quality nickel plated, 1/2. Refills 1/6 per dozen.

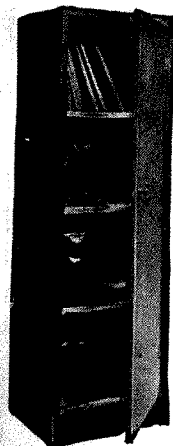
HIGHEST PRICES PAID
for all makes of

OFFICE MACHINERY:
ADDERS,
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CASHIERS,
ADDRESSERS,
DUPLICATORS,
TYPEWRITERS,
STEEL FURNITURE
and SAFES.

ELIMINATE LOSS
AND
FRAUD BY USING
A "SAFEGUARD"
THE BEST
CHEQUE
PROTECTOR



Used by leading Banks and firms. Do you realize that an altered cheque is your own liability—
Great Bargain £10 10s. each.
All makes of Cheque Writers at half usual prices. Ask for list.



Fire-resisting and Vermin-proof Steel Office Cupboards, finished art green, lever lock, duplicate keys.

6 ft. high, 2 ft. wide, 18 in. deep, as illustrated.

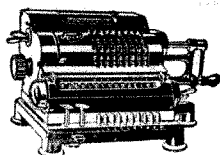
Other sizes in stock.

PRICES ON APPLICATION.

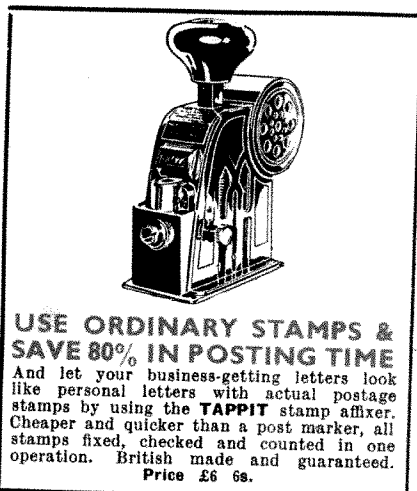
Essential for storing Books, Papers, Box Files, Letter Trays.

Other Furniture equally cheap.

ROTARY CALCULATORS ALL MAKES FROM £12 12s.



For all calculations. Multiplies, divides, adds and subtracts in 1/10th time taken to do so mentally.



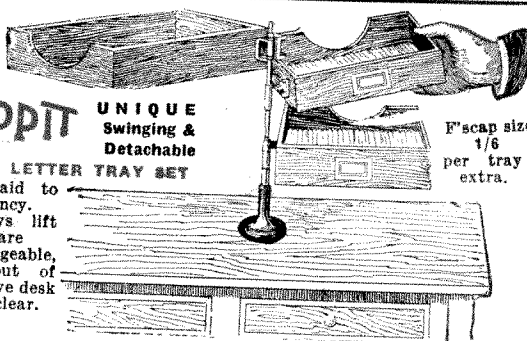
USE ORDINARY STAMPS & SAVE 80% IN POSTING TIME

And let your business-getting letters look like personal letters with actual postage stamps by using the TAPPIT stamp affixer. Cheaper and quicker than a post marker, all stamps fixed, checked and counted in one operation. British made and guaranteed.

Price £6 6s.

THE TAPPIT UNIQUE Swinging & Detachable LETTER TRAY SET

A big aid to efficiency. All trays lift off, are interchangeable, swing out of way, leave desk quite clear.



Number of Trays per Set.

Material of Trays. 4 Trays 3 Trays 2 Trays
Light or Dark Oak

Real Mahogany
Steel, Fshd. Art Green

PRICES ON APPLICATION.

Complete with post and fitting for wall or desk.

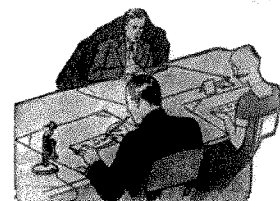
Approximate internal dimensions of trays
13½ × 9½ × 2½ inches.

SPECIAL OFFER

NEARLY NEW

Ledger Posting, Book-keeping and Accounting Machines, Loose Leaf, Fanfolds, or Book Writers, with or without Adding and Subtracting of all makes, at bargain prices.

NO MORE ERRORS—JUST USE THE GUARANTEED ADDOMETER. Rapid Automatic Addition and Subtraction. Rests flat on the books. For English and Foreign money, Decimal or Ordinary Figures and Feet and Inches. etc.



FOR POCKET OR DESK
So Simple Any-one can use it.

In Plush-lined, ducoid case.
Size.
11½ × 2½ × 1 in.,
95/-,
post free.

When ordering state for what purpose required. Also a cheaper pocket Adder for ordinary figures and Indian money, in case, 30/-, post free.



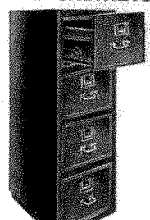
AUTOMATIC SELF-SEALING GUMMING PENCIL. Very useful for desk, applies liquid gum to papers. 1/6, post free. Similar Article in Rubber to apply moisture to stamps and gummed paper, envelope sealing, etc., 1/6, post free.

BARGAINS IN FILING CABINETS

PRESERVE YOUR LETTERS

and Records from dust and fire by using our ART GREEN

VERTICAL STEEL EASY RUNNING FILING CABINETS.

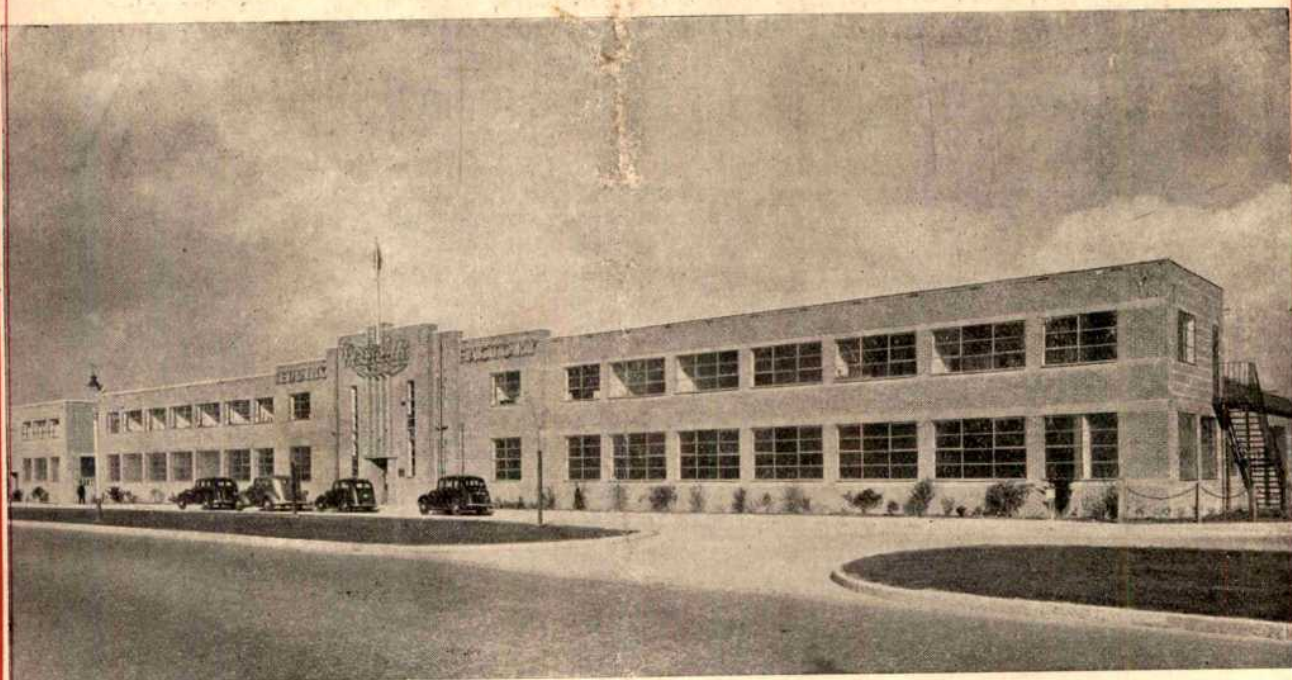


Phone: Holborn 3793, or write

TAYLORS TYPEWRITER MARKET

TEMPORARY TYPISTS SENT OUT.

74, CHANCERY LANE (Holborn End),
Works: Great New St., E.C.4. London, W.C.2.



NEW FACTORY FOR Messrs. J. G. MATTHEWS. & SON.
Built by John Laing & Son, Limited, on their Queensbury Estate.
Architect: H. C. Hollis, A.R.I.B.A.

JOHN LAING & SON, LIMITED, are developing four Factory Estates, where modern factories will be erected to suit tenants' requirements :

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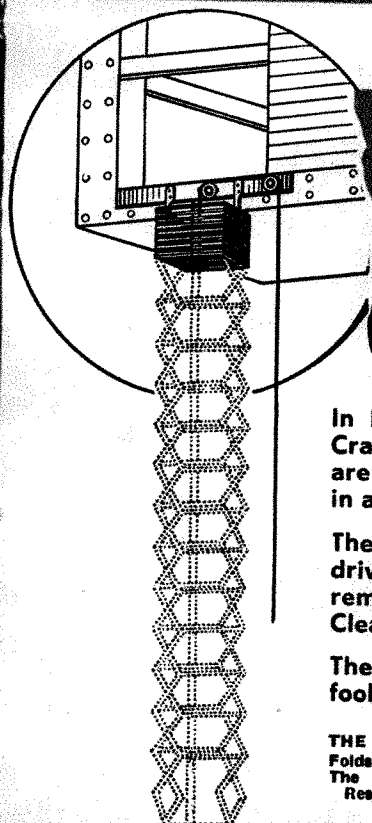
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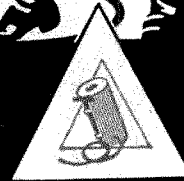
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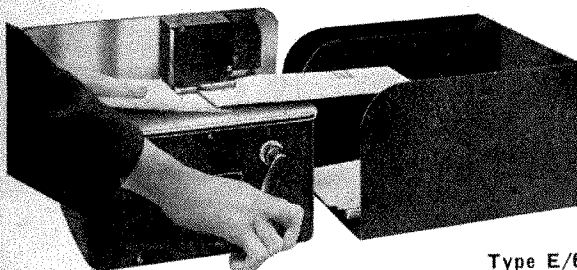


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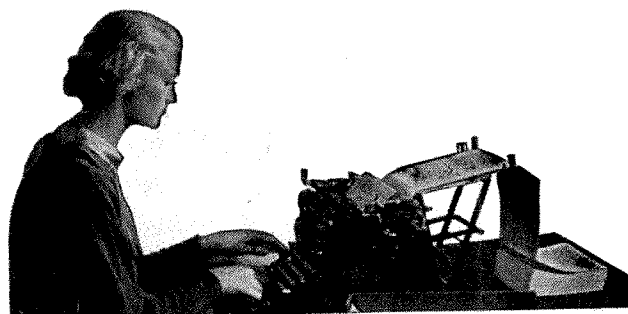
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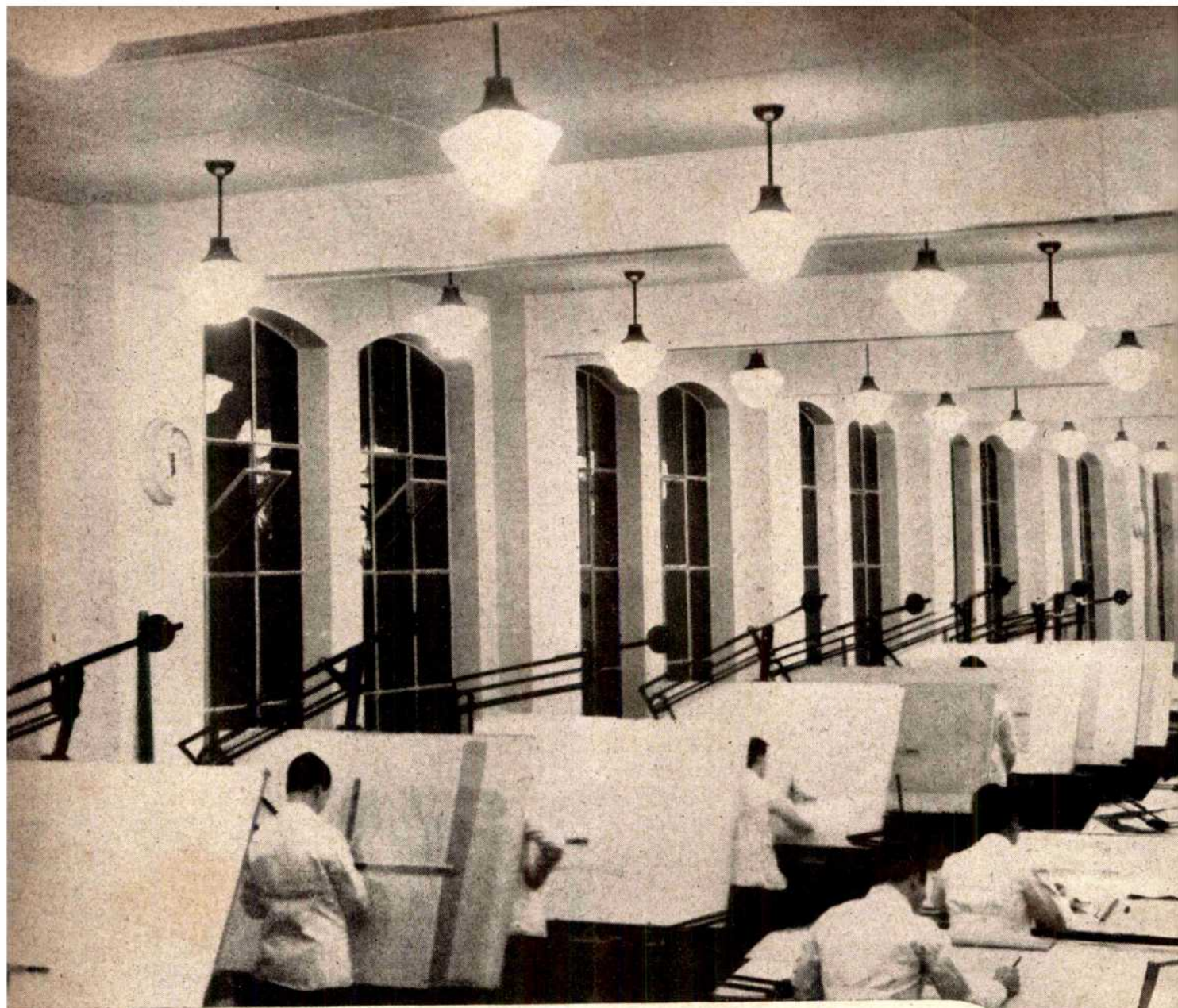
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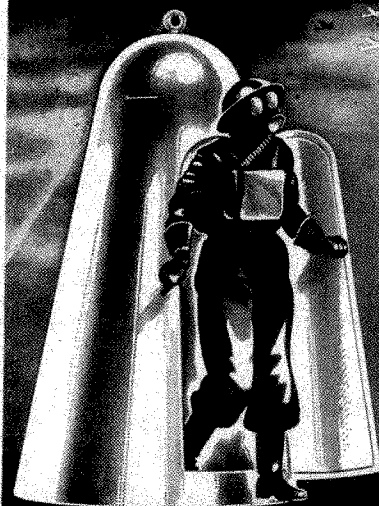
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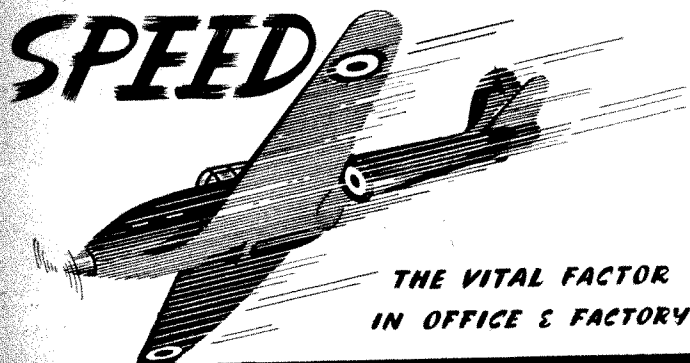
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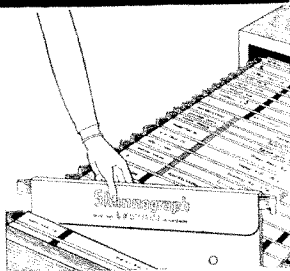
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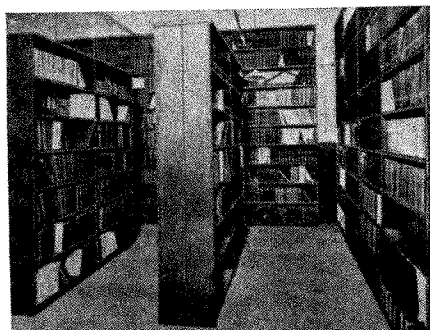


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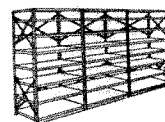
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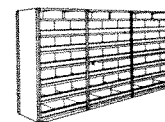
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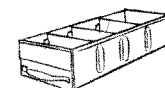
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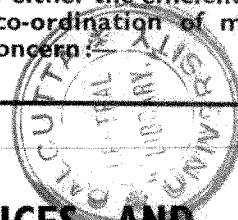
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TRAINING SCHEMES MUST BE DEVELOPED TO THE MAXIMUM EXTENT

"Take in more new workers for training on the job in your own works. Remember that the Government will help you with semi-skilled men and women trained under official schemes."

*(This is Point No. 2 of the Ministry of Labour's
"4-POINT PLAN TO INCREASE WAR
PRODUCTION" addressed to management.)*

THE OTHER 3 POINTS IN THE PLAN ARE:—

POINT No. 1. Skilled men are needed for the really skilled jobs. Be sure that each of your men is employed up to the very limit of his skill. Combat skilled labour shortage by breaking down processes wherever you can, and by training up your workpeople, both men and women, to jobs of greater skill.

POINT No. 3. Prepare, now, to employ more and more women. Look constantly to women for your new recruits; they are excellently suited to many types of semi-skilled work. Hundreds of thousands must enter war production this year and every factory must play its part.

POINT No. 4. Efficient personnel management is essential. Remember that you must secure the whole-hearted co-operation of your workpeople. Look closely to their welfare. Many of them may be new to industry; be patient and help them all you can during the first difficult weeks. A little foresight will reduce your labour turnover.

ADVICE GLADLY GIVEN ON THE DEVELOPMENT OF A TRAINING SCHEME IN YOUR WORKS.

If you feel you would like advice on the development of training in your works, remember that the Labour Supply Inspectors of the Ministry of Labour and National Service are ready and anxious to assist you. You can reach them through the Manager of your Local Employment Exchange. You can obtain full particulars of the Government Training Schemes from the Inspectors or from the Exchange.

REMEMBER! if you have not yet received your copy of "THE EMPLOYMENT OF WOMEN . . . SUGGESTIONS TO EMPLOYERS" instruct your secretary to write for one to-day, asking for pamphlet 87/1941 to the Manager of the nearest office of the Ministry of Labour and National Service.

MOBILISE FOR



ISSUED BY THE MINISTRY OF LABOUR & NATIONAL SERVICE

17 Employers Pool Experience on ABSENTEEISM

Decide it is a functional disease, not a local symptom.

So the Government report helps little—but these fundamental plans are getting surprising results.

There is a vital Ministry of Labour ruling, given to BUSINESS for your benefit, in this article . . .



AFTER hearing much evidence, the Select Committee on National Expenditure has made the following recommendation to solve the problem in the aircraft industry:

Sunday labour, except for maintenance and repair of plant and other essential purposes, should be discontinued.

There is a lot more to absenteeism than that. Absenteeism is a functional and not a local disorder, as so many Ministers seem to think. It must be treated as a fundamental evil not as some minor trouble that can be put right by the issue of a strong note from the works manager, of a pep talk by a junior director.

For months past, I have been in correspondence with readers of BUSINESS on this problem. The evidence which we reprinted from a research by a member of the National Institute of Industrial Psychology aroused particular interest. In particular, Mrs. Winifred Raphael made the point that too many workers believe their absences go unnoticed.

Incompetent Management is Largely To Blame

But most of my correspondents were convinced that absenteeism was a dangerous symptom of incompetent management more often than evidence of slackness and apathy among the workers. Having gone into the subject closely with seventeen concerns during the past month, some significant conclusions have emerged. But they are not the conclusions of the S.C.N.E.

The subject is so vital, the need for its improvement so urgent, it is a pity

that the Committee of National Expenditure did not devote more detailed attention to it. However, the following conclusions can be read in conjunction with an otherwise admirable report.*

In a well organised works, absenteeism does not run much above 5% normally. Under war-time conditions, which include poor transport, absence from home in many cases, long hours and visits from relations, it is unlikely to run less than 7%. In the aircraft industry and many others it is certainly running anything from 10% to 20%. This not for one week, but for fifty weeks in the year. If some of the causes are controllable, others are not. But all can be modified, if not prevented. For the main causes of absenteeism will always boil down to these six:

- (a) Ill health.
- (b) Fatigue.
- (c) Visit of a husband or friend.
- (d) Big money on Sunday work.
- (e) Objection to paying income tax.
- (f) Lack of interest in the work.

Extension Of Welfare Work Is One Solution

Even the first of these can be dealt with. Witness the evidence of Mr. B. Foyle, a director of Boxfoldia:

"We endeavour to combat illness which might account for absenteeism in various ways. The distribution of malt and oil and of prophylactic against colds and influenza, the provision of nourishing meals at low

*Fifteenth report of the Select Committee on National Expenditure, H.M.S. Stationery Office, price 2d.

How many of your employees' cards will remain in the "Out" board to-night? These experiences of many well-known firms will help you to keep your absenteeism down to a reasonable percentage

The Five Causes and Some Tested Remedies.

1. ILL HEALTH.

Distribution of malt, oil, anti-cold and 'flu prophylactics.
Canteen hot meals at low cost.
Vitamins (cleaned carrots) cheaply.
Inoculation service.

2. FATIGUE.

Comfortable transport facilities.
Maximum 54-hour week.
Time off for shopping.
Part-time work for married women.

3. VISIT OF HUSBAND OR FRIEND.

Time off for women.

4. BIG MONEY ON SUNDAY WORK.

Confine Sunday work to night shifts.
Absentees cut out of all overtime.
Absentees refused Sunday work.

5. LACK OF INTEREST.

Ruling forbids worker to be absent from any part of normal shift, however paid.
Creation of feeling of security.
Complete insurance schemes.
Allow women to sing in shops.

cost and of vitamins in the form of carrots already cleaned for eating, and the extension of our usual medical services to include inoculation against disease, are some of these steps."

With all these, Mr. Foyle reports an increase of absenteeism since the outbreak of war and notably last winter, particularly among the women, due to illness. He says that "We are tightening up and adjusting our existing organisation for the provision of the proper working conditions. The maintenance of medical and canteen services has done much to reduce the incidents of illness."

The problem of fatigue is an extremely difficult one. It is a particularly difficult factor where a large proportion of the workers are women.

The works manager of a large factory in a notably well-organised combine has a force of which no less than 85% are women.

Only a very small percentage of these consistently absent themselves without leave. Until recently such persistent offenders were discharged. Now this action is difficult under the new Essential Work Orders. His difficulty is with Saturdays. A number of women are apt not to return to work after the lunch break.

Total Shift Time is Basic Period Of Engagement

Very many employers believe that under the Essential Work Orders they are unable to compel any worker to do a single hour's overtime. So much confusion is arising over this matter that BUSINESS has secured a ruling from the Ministry of Labour and National Service. That ruling is as follows:

The period of engagement of any man or woman on work of national importance is the total time of the shift. This may be paid partly at the normal hour rate and partly at the usual overtime rate. No worker is legally permitted to absent himself for any part of the normal shift time, however paid.

The penalties for a breach of these regulations is first an appearance before the local National Service officer and for any repetition of the offence, an appearance at a Court of Summary Jurisdiction, where a fine of up to £100 or imprisonment up to three months may be imposed.

The Ministry is so concerned over this particular feature of absenteeism that it is already seeking further drastic powers.

Women Workers Should Be Given Time Off

On the other hand, both the day and night shifts of this concern are of twelve hours with one and a half hour meal breaks. This is a drastic alternative of working three shifts.

To mitigate these long hours, women, especially the married women, are allowed to go early once or twice a week for the purpose of shopping. If husbands or sweethearts are home on

leave anything up to a week's absence is granted. A girl getting married is granted a week's leave.

Most experienced employers are agreed that the Minister of Aircraft Production's decision to work a seven-day week was one mistake and the decision to work a 60/70 hour week another.

It would be interesting to see what output was achieved by this concern when its working hours were reduced to a 56-hour week.

There is unanimity as to the necessity for letting women workers have a few days off, especially when husbands or boy friends are home on leave. At Boxfoldia the work is so organised that they can allow a woman to be absent for a period up to a week without undue dislocation. Incidentally, this same method of organisation uses a certain number of part-time workers.

They find that under war conditions women members of the staff who marry will carry on their work if they are permitted to put in a reduced number of hours. In two departments in the office, for instance, married women are allowed to attend all day on Monday and Friday and half a day on Tuesday, Wednesday and Thursday.

Give Night Shift Sunday Daytime Work

These breaks are annoying and certainly can affect output seriously at times; but they are a feature of war-time conditions and the management must adapt themselves to meet such breaks in individual's work.

WHY NOT CHANGE SHOPPING HOURS?

ARRANGE the opening hours of shops to suit the convenience of those assisting the Country by service in industry. One cannot imagine the entertainment industry ignoring the public, and cinemas and theatres opening between 9 a.m. and 6 p.m. and remaining closed in the evenings!

Under to-day's exceptional circumstances it should be possible for the Government to arrange for the opening of shops during week-ends (with corresponding closing days during the normal working week) or at least during the summer to insist upon opening from, say, mid-day to 9 p.m. In this way the need for time off to shop—with consequent dislocation of production—would not arise.

Suggestion by a Midland Managing Director.

Even more difficult is the problem of Sunday work, but not so difficult as the S.C.N.E. suggests. Here are three excellent solutions: one concern confines Sunday work at double pay to the night shift. The men on this shift, therefore, work five nights a week of 10½ hours each and seven hours on Sunday. The day staff work 10½ hours from Monday to Friday and 4½ hours on Saturday morning, and 3 hours overtime in the afternoon.

This scheme secures two desirable results. It gives the men on night work a compensation for the discomfort and fatigue involved to their wives as well as to themselves. It avoids the temptation of absenteeism because only by remaining on the night shift can men secure their double pay on Sunday.

One Firm Stops Absentees' Overtime Work

A second concern has found an even more complete solution. (Curiously enough in the aircraft field).

An agreement has been reached with the Shop Stewards, by which any worker guilty of persistent and inexcusable absenteeism will be compelled to work his or her 47-hour week in normal working hours and be deprived of any form of overtime payments. Failure to work a full week under these conditions will involve a report to the Ministry of Supply tribunal.

Out of five hundred odd men in the fitting shop, only eight or nine, 1.6 to 1.8 per cent., are guilty of persistent absenteeism. They are definitely of the "old sweat" type—wanting the maximum cash return for the minimum of energy output.

Proof that Sunday labour and rates are largely responsible for absenteeism, the staff supervisor says, is to be found in the records of the night shift. These men are paid only rate and a fifth, but do not work on Sundays at all. They present no absenteeism problem at all.

Mr. Leslie G. Jeffries (a works accountant) gives us the third solution. In the concern with which he is associated it has now been laid down as a ruling that employees absenting themselves during the normal working week will be refused Sunday work.

Workers' Apathy Is Largely Fault Of Management

It is true that in many industries, a Sunday closed down is almost essential for the sake of the plant as well as the people. But where no heavy machines are in use, it is certain that Sunday shifts can be worked without serious absenteeism by any one of the three methods described.

Most far-reaching of all causes of absenteeism is apathy. One works manager goes so far as to tell us that the complete lack of interest among the women workers is their chief obstacle to output. "Only after a serious and bad raid do we have a full complement of enthusiastic workers."

Surely all managerial experience

shows that complete apathy of this sort is due to the attitude of the management to the workers and the work. It is true that women are naturally less interested in money than men. Few of them have homes to keep. However, women feel long hours more than men since so many of them have housework to do in addition to their job at the factory. Further, the woman evacuee presents a special problem in apathy.

Work in Provinces Bore London Evacuees

Says one manager of absenteeism: Naturally enough we find this worse with our women workers who are evacuees from London. These are among the quickest to learn, the cleverest and altogether the brightest girls we have ever had in the factory. They must have been among the cream of the workers of their London firm. But I fancy they find steady work in a provincial town monotonous and a day off gives spice to life.

What is the remedy for this apathy?

The most important is the creation of the feeling among the workers that while they work reasonably well they have a safe job here. The creation of this feeling of confidence is of course largely up to the foreman. And it takes time.

A second is our contributory endowment scheme under which a woman can leave the business at 45 with a payment from the scheme depending on her years of service and her contributions. The firm pays the whole premium during the worker's illness, a service which is very much appreciated.

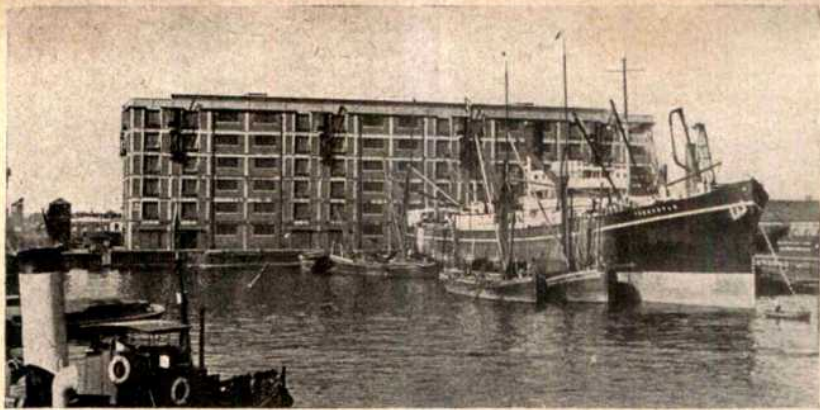
Two other small factors help. We always allow the girls to sing in the shops. Some directors are against this but I have never found it do anything but good.

Artificial Production Stimulants Provoke Workers

Finally we were extremely fortunate in being compelled to build our canteen about five minutes' walk from the works owing to pressure of our space. This has made it more popular, giving everybody the feeling they are right away from the works during lunch time. This makes the lunch hour a real break. Better still, everybody gets a breath of fresh air and exercise in walking to and fro.

Incidentally, you will find no "work-chasers" in our factory nor any of the American devices for stimulating output by showing a chart or barometer of the day's work. My experience is that these artificial stimulants work for a short time, but are apt to create a much longer cynical reaction.

Finally, of course, we try to keep our relations with the workers as human as possible. My experience has put me against ostentatious welfare schemes. I know women workers very much appreciate the services of a trained nurse given quietly and without fuss. Otherwise, the less we interfere in the private lives of our workers in this country, the better.



The Facts About The New Export Policy

THE logic of events has compelled the Government once again to modify their export policy. The first war months were a period of uncertainty without adequate advice from the Board of Trade or any other Department. This ended in the early spring of 1940 when the Export Groups were given a vigorous send-off.

The third phase was that of contraction in the spring of 1941. During that period the tests of whether exports should be incurred included not simply the earning of exchange, the essential or non-essential rating of the goods, but the value of the exported product in relation to the raw material used to make it, as well as the scarcity of the raw materials involved.

Three new factors now affect the situation. One is the actual operation of the Lend, Lease Act, releasing us from the necessity of earning dollars at almost any cost. The second is the increased scarcity of raw materials, due partly to a much larger output of war goods. The third is the necessity for hoarding shipping space to carry these goods.

Canada Should Be Our Most Important Market

The present situation is, therefore, definitely adverse to export. In North America, Canada is the most urgent market since in that country we have no Lend, Lease Act. We must export what we can to Canada to pay for our enormous imports of munitions, planes, food.

In South America, only Argentine and Uruguay are at present long on sterling. Every other South American state is short.

The whole of the Dominions and Colonies except Canada and Hong Kong being tied to sterling, our exchange resources are not benefitted by their buying from us; on the contrary their credit balances are thereby lowered. If they must buy, it is better, however, that they buy from us than

the U.S., which would mean a loss of dollars to the Dominion concerned.

Finally, the total amount of shipping space available has fallen slightly, while the amount of raw materials employed for making war goods has enormously increased and is still increasing.

In these circumstances the Board of Trade could hardly be expected to encourage exports to any country other than Canada, the United States, Argentine, Uruguay, Portugal, Turkey and Egypt, and a few minor markets. The position of firms who have specially manufactured goods in support of Export Group drives, who have appointed new representatives, who have specially advertised in overseas markets is extremely hard.

Every World Market Must Be Kept Alive

There are, however, certain points to watch. At any moment, almost any of the Latin-American states may suddenly become long on sterling. For instance, we have only to buy a big supply of copper from Peru, of coffee from Colombia, of oil from Venezuela, to make these countries into favourable markets. This may be small comfort for the exporter who has been caught out by the present change of policy, but it gives at least a ray of hope.

At the moment, business men must impress on the Board of Trade the need for keeping a trickle of trade going to every foreign market we still possess. We must not let any country forget that there is an England. After the war we shall need orders urgently from every one of our former foreign markets. How can we hope to get our share unless we keep the names of our manufacturers before the foreign consumer.

It is for every Export Group to face up to this unhappy situation and to do what it can to preserve the goodwill of its makers abroad through its own efforts.

C.C.

Part-time Women Workers are a Success



FACTORY expansion in non-industrial areas often produces a demand for labour which it is impossible to satisfy. This is especially the case where the normal peace-time activities of a district had already absorbed almost the whole of the available number of workers.

One of this company's factories is located on the fringe of London in an area which is mainly non-industrial and is composed almost wholly of "dormitory" suburbs. In peace-time, work is normally found for several thousands of men and women—practically all that the area can provide.

Problems of this kind are not, of course, cured by any one panacea, but one simple line of approach has contributed in no small measure, and it would probably help others to know about it.

Popularity of Scheme Proved by Long Waiting List

We have introduced a system of training and employing women on a part-time basis. In the few months this system has been in operation the question of labour shortage has not arisen. In fact, we have to-day a waiting list of several hundreds of women who are willing to work for us in their spare time.

It is common to hear women expressing a desire to "do something" to help the war effort and bemoaning the apparent lack of need for such untrained services as they can render. Many of their imaginations do not go beyond nursing and canteens as "war work" meriting spare time services.

In discussion with the local organisers of the W.V.S. we found they had great difficulty in satisfying all requests to be put to useful part-time work, especially as there was a considerable body of applicants who felt unable to offer their services on an

Shortage of labour is resulting in production delays. This important Company discovered one solution to the problem among the middle-aged women who are anxious to help the war effort but are unable to devote their whole time to it.

By **N. V. KIPPING,**

Works Manager, Standard Telephones & Cables Ltd.

entirely voluntary basis. There are many households in which domestic circumstances prevent the housewife from working normal factory hours. Such women, often with only the husband's Army separation allowance on which to live, want to find part-time work that is both practicable and patriotic as well as an income-maker. Others do a few half-days' domestic work, but need further sources of income.

Workers Select Their Own Shifts

We felt that these women would provide a large reserve of potential workers who could be added to our labour forces as needed, provided means could be found to adapt hours and conditions of work to their domestic circumstances. After careful thought we worked out a plan, which has proved so successful in operation that of all the women employed under it only 3 per cent. have dropped out.

The hours of work under this plan were:

Mornings:	8 a.m. to 12.30 p.m. Monday to Saturday inclusive. Total number of hours worked per week—27.
Afternoons:	12.30 p.m. to 5.30 p.m. Monday to Friday inclusive. Total number of hours worked per week—25.

Applicants permanently join either the morning or afternoon shift, at their choice. There is no change about between the shifts. This half-day manning removes the necessity for a luncheon interval, although, of course, the workers are permitted to use the works canteen after or before starting their shift, as the case may be. Employees are rated on an hourly basis and the rates are the same as for full-time workers. Piece-work and proficiency bonuses apply in the same way as for full-time operators.

Owing to the unusual nature of the plan, we felt it wise to introduce this experiment in a branch factory where some 250 girls were already employed on full-time work, rather than in a part of the main factory where failure might have a wide-sweeping effect. In addition, this branch factory was in the heart of a "dormitory" area and

there was thus the element of an experiment of taking the job to the district containing the labour supply, rather than bringing the labour to the job.

Co-operation of Full-time Workers Helped to Bring Success

Careful explanations were given to the whole-time girls in seeking their co-operation to help the part-timers to feel at home, and also in getting them to introduce their friends and relatives who might wish to apply. The full-time girls displaced by the part-timers were all, of course, needed for expanded production at the main factory when they had completed the training of the first batches of part-timers.

With no more publicity than the announcement to the full-time girls and the discussion with the local organisers of the W.V.S., the response to this scheme has been excellent and the rate of absorption has been approximately 40 per week.

Most helpful co-operation was received from the manager of the Labour Exchange concerned, who arranged to send a representative to the factory on a specified day each week to complete the insurance and other formalities, so avoiding wastage of time in queueing at the Exchange.

Middle-aged Women Prove To Be Eager Learners

The types of women to whom this work has appealed cover a very wide range. Many had not sought employment during the last ten years or so. Some had never done factory work of any type before, but a fair number have been found with experience; in some cases old employees of the company, who had left to get married, have returned. As I have previously stated, only three per cent. have dropped out, so it will be seen that the number of misfits has been very low indeed. A few of those who have first come into the factory under this part-time scheme have found the work so attractive that they have applied to be employed full-time.

(please turn to page 16)

MANAGEMENT in War-time . . .



TO get quick, effective action seems to grow more difficult every day in many rapidly growing war concerns. Growth means the spreading of authority, some improvisation, inexperienced men in key positions. Follows delay, indecision, inertia.

One fruitful source of trouble is the committee, be it executive, technical or departmental. Quite indispensable, the committee itself can yet be the biggest brake on action in the whole business.

Three chief danger-spots can be usefully watched. First comes the agenda. The agenda of the average committee is hopelessly overloaded. Try cutting the agenda down from ten items to three. Insist that these three be fully discussed and decisions arrived at. Let the next agenda carry out those other subjects, and so on. Many items reaching the agenda can be settled by two men without any committee ruling. Very few committees can usefully work or more than three subjects in an hour. And business committees should never last more than an hour.

Next is the long-winded talker. He is the chairman's problem. The committee chairman who hasn't acquired a technique for closing him down by drumming on the desk, the interrupting question, hustle and quick change of subject isn't the man for the job.

THIS COMMITTEE INCLUDES A "CHASER"

THE most serious trouble remains. The failure to get prompt action on decisions taken. New war-time methods are working wonders here.

One of these demands two new departures. A senior executive (*not* a member of the committee), attends purely as a "chaser". His work is to see that the work (say in the case of a modification in design of a part), is

carried out immediately by everybody involved. In some cases the notes of the meeting on which this executive works are made by a typist not associated with the work of any member of the committee.

Another remedy is the addition of a time schedule for the complete execution of every stage of the work caused by each decision of the Committee. Any failure to meet such times must be reported to the Chairman immediately the danger of delay is clear. On receipt of such a Delay Report, the Chairman must make a special effort personally to secure action.

INSTRUCTIONS OUT EARLY — OVERTIME WILL FALL

SAID an experienced production executive, to the editor the other day: "My personal view is that a great deal of staff overtime is caused simply by the failure of senior executives to give full and detailed instructions in the early morning to their juniors and foremen as to the work to be done during the day. By delaying to issue instructions, executives cause endless loss of time in waiting instructions during the forenoon, with consequent overtime in the evening.

"Competent foremen and charge hands naturally resent this. They know very well that, with prompt and accurate instructions, there is ample time during the normal working hours to get the day's work done, save in very exceptional circumstances."

WHAT HOURS SHOULD THE STAFF WORK?

MANY managements are concerned over the hours the staff are working in these days. With the works on nine- and ten-hour shifts, many staffs are putting in an equal amount of overtime.

Is this necessary? Should the extra hours be paid for specially?

Obviously there can be no general

rulings on these questions. Addition of a new department, change in a model, opening of a new factory, all these may involve the staff in endless overtime. Whether this work should be paid for depends on the salaries of the men involved and a number of other considerations.

The interesting question is whether under normal war-time conditions of work, over-time should be necessary for the staff. The general answer is that if over-time is continually necessary, then the concern is understaffed. The remedy is not constant overtime and fogged executives but—more staff.

If overtime is not continually necessary, then it should be discouraged. No useful purpose is served by bringing staff hours into line with works hours. Incidentally an unnecessary expense is involved. For recurrent overtime must eventually be paid for.

PREPARING FOR A BLITZED OFFICE

REALISING the immense loss of time which would result and the impossibility of contacting every employee if their building was struck by a bomb and the whole area put out of bound by the police, fire and A.R.P. officials, a leading publishing company has issued detailed written instructions as to the routine to be adopted if the eventuality arises.

Every employee is instructed to proceed as quickly as possible to another building about a mile away and to assemble outside. Executives have been issued with passes to this building. If this alternative meeting place has also been "blitzed," a further rendezvous in a large open square with several entrances is listed.

KEEPING TRACK OF UNFILLED ORDERS

A WHOLESALE selling a wide variety of small items purchased from a number of different sources was experiencing the inevitable war-time difficulty in filling orders promptly because one or two items would so often be out of stock. As a means of keeping a record of individual items ordered but not filled, he made up a peg board, numbered to correspond with each number in the stock bins.

When an order comes in for an item which is not in stock, a ticket is placed on the board showing both the stock number and the order number and quantity. A glance at the board is enough to show instantly just what quantities of which items are needed to complete all the orders on hand at any given time. It enables the wholesaler to decide when rush delivery must be asked for and to determine when the order can be filled and dispatched.

This Invoicing System Automatically Gives Us Detailed Sales Analysis

FOR some time past, the management had considered the installation of a "punch-card" system, with a view to replacing the existing system of mechanised accounting, which had previously been confined to the invoicing and sales ledger work.

The system we installed has now been in operation on the invoicing, sales ledger and sales statistical work for ten months, and it has proved so successful that we have just extended it to cover the corresponding work for one of our associated companies.

The installation in use comprises tabulator, sorter, combined reproducer and summary card punch, and hand punches and verifiers. For use in the invoicing work, we have set up a file of name and address cards, containing a set, or sets, of cards for each of our customers, and a file of invoicing cards. The latter file contains sets or cards for all usually ordered multiples of every commodity and such cards are already extended at the various discount rates, and are also punched with the amount of purchase tax assessable on the particular quantity involved.

Customer Numbering System Is Basis Of Sales Analysis

Every order received goes first to the sales department which has a comprehensive index of all customers. Each customer has been allotted a serial number of five figures, the first two of which represent the county, while the remaining three designate the town and the customer's individual number in that town. The importance of this numbering for area sales analysis will be readily apparent. An idea of the magnitude of this index may be gathered from the fact that, when recently adapting the system to our associated company, the work involved the punching of well over 120,000 cards.

Pre-Punched Cards Speed Calculation of Price

From the sales index a clerk enters the customer number, discount rate, commission code etc., and whether a six-month purchase tax certificate is held, the order then being passed to the accounts department who type the necessary particulars on a dispatch instruction form which is then sent to the depot which is to execute the particular order.

On the return of the dispatch instruction (now a dispatch advice) to the accounts department, a "terms" card is punched, containing the information previously entered on the order by the sales clerk.

The dispatch advice and the "terms"

Daily check on Stock, Sales, Discounts, Commission, Credits and Purchase Tax is possible with this comprehensive, error-proof method

By D. W. PRATT, A.C.A.,

Chief Accountant, International Chemical Co. Ltd.



card then pass to a junior who, working from the customer number shown on the advice, pulls the appropriate name and address cards from the file previously mentioned. All these cards and the dispatch advice then pass to the invoicing file which, as previously mentioned, contains pre-punched cards for all usually ordered multiples of every commodity.

Purchase Tax Figures Are Easily Extracted

At a fixed time each day all the cards are passed through the reproducer which punches the customer number, dispatch advice number and commission code from the "terms" card into the following detail cards until it reaches the first name and address card of the next batch.

Reference to the invoice illustrated will show that individual items do not disclose the amount of purchase tax included, although the rate of tax is clearly shown. The tabulator, however, in addition to totalling the invoice, is also accumulating in a separate counter the total of the purchase tax and, at the end of the invoice, the total excluding tax, the amount of the tax and the total including tax are printed in turn. At the same time a summary card for ledger posting is automatically punched containing these three figures, in addition to the customer number and commission code.

Discovery Of An Error Would Be Automatic

The invoices are then checked with the dispatch advice for quantity and description only, there being no call to check the extensions which must be

correct. An error in the extensions would only be possible if the operator had pulled cards at the wrong discount rate and the tabulator gives us a complete check on this by controlling on discount rate and therefore throwing up any difference between the rate shown on the "terms" card and that punched on the invoicing cards.

Credit notes are prepared in exactly the same way as invoices but it is interesting to note that, in dealing with packing cases, the card which is used to invoice a case in the first place is also used to credit it on its return.

At the end of each week, all the cards used for invoicing during that week are passed through the sorter which sorts them under products and packs and under each heading sorts the cards into numerical order of dispatch advice number, this operation taking place at the amazing speed of 24,000 cards per hour.

A tabulation then provides the sales report which shows the quantity and value for each pack and the value for each product, together with the grand total and the total purchase tax charged.

There Can Be No Query About Depot Stocks

Immediately after completion of the sales report, the same cards are passed through the tabulator a second time but, on this occasion, the machine is set to list the individual cards for quantity and dispatch advice number. If, therefore, any difficulty is experienced in agreeing the physical stock at any depot with the head office stock records, these lists are sent to the

(please turn to page 14)

Chasing War-Time Supplies

BEFORE the war the progress department of a well known engineering firm consisted of four people inside the factory to chase from the goods inwards to stores, stores to shops, and eventually to finished stores. Another employee acted as liaison officer between sales and finished stores, and this progress staff had opportunity in their spare time to chase supplies from outside suppliers.

As war-time conditions started to brake production the progress superintendent decided that another employee should be added to the progress staff to be engaged solely for the purpose of telephoning suppliers.

For a time this alteration appeared to work smoothly, but it was not long before the old troubles of delay re-occurred, until finally one day the factory actually stopped because a gross of certain high tensile steel bolts did not arrive. Something had to be done. A works management council was immediately called and was in session until well into the night.

One-Man Chasing Proves Difficult and Unsatisfactory

Various ways and means were discussed without very much progress being made until the works manager, in exasperation, remarked that he supposed he would have to go out and get supplies himself if they were wanted urgently. This chance remark gave the progress superintendent an idea. Why not have an outside chaser in close touch with the factory, going from supplier to supplier for the urgent goods, and personally seeing that they were put on passenger train?

The senior member of the progress staff was given, next morning, a list of firms and details of the orders that were most pressing. Off he went by train with an instruction that he was to send in a daily report of how he got on. The first week's results were extremely disheartening. Some days it was as much as he could do to fit in two calls owing to the distance between suppliers and the difficulty of getting train connections.

The Country Must Be Divided Into Supply Areas

A further works management committee was called to review the situation and certain members who had opposed the idea when it was first launched appeared to have some grounds for their opposition. The works manager pointed out that one man was not physically capable of covering the whole of England by train. He submitted the idea that it would be advisable to provide a car.

This proposition would have been adopted but for a chance remark by the works accountant to the effect that, if they first found out the principal districts where their main suppliers were located, it might help in making

A New Plan That Really Works

By ERIC MARCUS, Business Consultant

As a business consultant, Mr. Marcus has achieved notable successes for firms in a wide variety of industries, and by special arrangement, **BUSINESS**, is now able to offer readers Mr. Marcus's advice on organisational problems, free of cost. Present conditions have brought their peculiar difficulties, but whatever your organisational problem, set it down, with all the details you can, and post it to Mr. Marcus, c/o the Editor, at the address of this publication.

a final decision. This was agreed by the meeting and the office manager was requested to supply all the names and addresses of suppliers with whom business had been done within the last two years. From this information, a map of England was flagged with suppliers by locality, and it was found that 95 per cent. of the suppliers were in six distinct areas.

Personal Contact With Suppliers Helps Speedy Delivery

It was a bold decision to appoint six production chasers, one for each district, with cars. But it has been found over many months that it was a sound policy. The area production chasers soon became known personally to the suppliers, and, being constantly on the spot, were in a position to advise

the factory regarding impending delays and shortages.

The progress superintendent sums up the position and the advantages of the new system in the following brief comment: "We know we have got to have an intelligent type of individual to do this outside chasing work and pay him well. I had a case the other day where one supplier was bombed. The area production chaser has contacted another firm who could do the job before we knew the first supplier had been bombed."

The tremendous effort that must be made these days to obtain vital supplies varies with different industry, but this simple, if at first somewhat costly, system has proved so successful in operation that it might be adopted by almost any manufacturer.

These Three War-Time Stock-Keeping Systems can Help You

THE firm that worries whether it is getting its vital supplies in war time usually ends up with the least delays in production.

It may appear strange to many readers that there are still firms who think by merely placing an official order, that there is some sort of guarantee that the date of delivery requested on the order will be effected. I have found suppliers are just as keen to render the good service of pre-war days, but changed circumstances will

not permit promises of delivery given in good faith to be kept.

The problem of how to get supplies so that production is not held up is far deeper than appears on the surface and the factors which govern it are similar in most businesses. The basis of good progressing is stock control, and a set minimum on a stock control card greatly simplifies the problem.

The stock control section should, therefore, be considered to be the

(please turn to page 14)

Description										Part No.		
MAXIMUM:					MONTHLY WITHDRAWALS					MINIMUM:		
JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	
JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	
Date	Order No.	Quantity	Req. No.	GI No.	Amount	Balance						

This simple stock control card gives two years' figures at a glance and can be understood by a tyro

This Invoicing System Gives Sales Analysis Automatically

(continued from page 12)

depot concerned to facilitate reconciliation of the issues from stock during the period.

At the end of the month, the invoicing cards used during the month are sorted on the first two figures of customer number and are then tabulated to give a county analysis of sales, which is in a form similar to the weekly sales report. Further analyses (a) by representative's area, segregating personal business, orders received direct from the territory, and orders from large wholesalers, etc., on whom the representative does not call, and (b) by class of business, for example, retail, wholesale, multiple stores, etc., are obtained.

It will therefore be seen that the identical cards which are used for invoicing the order in the first place provide us with all our subsequent sales statistics.

During the month, the ledger posting cards, which were automatically summary punched during the preparation of the invoices and credit notes, together with any cards punched for journal entries etc., are sorted every two or three days to customer number, thus enabling a statement of the position of any account to be extracted at any time.

A similar procedure is followed with the cash cards, which are hand punched from the cash book. At the end of the month, the cash cards, invoice cards credit note cards, etc., are sorted mechanically into the ledger file, which

already contains the name and address cards and any balances brought forward from the preceding month. The resultant file is then passed through the tabulator to provide the statements printed in duplicate, the copies being filed and forming the actual ledgers.

After the completion of the statement work, the cards from the current month's transactions, excluding cash, are sorted out of the ledger file and, after sorting on commission code, are listed to provide a statement of the total business done by each traveller at each commission rate.

Purchase Tax Figures Are Separately Assessed

After the preparation of the commission accounts, the same cards are again listed, but this time the machine is picking up its information from the section which was summary-punched with the purchase tax. This list is agreed with the totals credited and debited to purchase tax account during the month and is available for production to the Customs and Excise Authorities in support of these figures.

I do not pretend that this system of invoicing and accountancy would be so successful in every case. Where, however, the prices, discounts and commissions are standardised, it can be used to lift much of the heavy routine and strain from the accounts department. It has also proved very successful in handling "peak loads" and, in addition, the advantage of having the extensions already punched on the cards, with no risk of error, is readily apparent.

These Three War-time Stock-Keeping Systems Can Help You

(continued from page 13)

primary department in the chain, and, in consequence, the records of this department must be designed with care, and when once put into operation, always kept up to date, otherwise the records will be useless. The internal working of this section should be made as simple as possible so that replacement of staff in the cases of illness, etc., is a simple matter.

Our simple stock control card, adaptable with slight alteration to the requirements of most businesses, is shown at the foot of page 13. The interesting features of this card are the tabulated withdrawals from stock month by month, giving a record of twenty-four months and the maximum and minimum figures.

Tags and Visible Index Cards Show Position At a Glance

These latter figures are fixed by the production engineer. It is thus the duty of the stock control section to notify the production engineer immediately the minimum stock is reached, so that the matter can be given immediate consideration and a decision made whether or not the article should be ordered. Upon receipt of this information the production engineer decides the quantity for the buyer to order, and further indicates to the stock control section any alteration to the maximum and minimum figures.

Instead of stock control cards there are, of course, other methods which have been tried with success and, while these suit some businesses, they do not suit all. For instance, one large firm uses a serially numbered tag which is tied on to the article when it is received in the stores, and the following information written on the tag:

Part number.
Description of goods.
Number and date of goods inward note.
Name of supplier.

The tag is removed when the article leaves the stores and is sent to the buying department, and if the article was received within the last six months, it is automatically re-ordered.

Another system that has been tried with general success is the visible card index system which by means of coloured signals at a glance the position is known. Undoubtedly if the business is large enough, a system of punch card accountancy could be installed with profit. The basis of this system is a single card per unit. It is very similar to the tag system with the exception that the cards can be sorted into any desired order, and, finally, a printed list can be obtained again in any order that is required.

The obvious advantages of this system are that it is not necessary to have stock control ledgers, as the cards themselves form this record. The cards can be used over and over again.

INVOICE		INVOICE No. 12665																																																																																												
INTERNATIONAL CHEMICAL COMPANY LIMITED		TELEGRAMS: BOLROKEMIC FINEPASC LONDON																																																																																												
MANUFACTURING CHEMISTS		TELEPHONE: STAMFORD HILL 8871 14 LINES																																																																																												
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The standard invoice of International Chemical Co. Ltd. is a clear but comprehensive form. It embraces all the material figures of the order, carefully segregating the net cost of the goods from the purchase tax—an important point when reckoning discounts and representatives' commission.

TREND OF TRADE

War Puts Business into a Strait-Jacket

says CECIL CHISHOLM, M.A.,
Business Consultant

EVENTS move fast these days. Since I last wrote, clothing has been rationed, Lord Beaverbrook has taken over control of priorities, concentration of industry has completed its voluntary stage and export policy has been drastically revised (see page 9).

All these are official moves. Unofficially something equally startling has happened. The dissatisfaction of expert industrialists with the Government's failure to get any sort of control or co-ordination into War Production has at last been ventilated. *The Times*, the *Observer* and the *Economist* have all given damning evidence.

The facts are not in question. At this moment, after twenty-one months of war, there is still no central control of production. Every department orders on its own initiative, competing with others for the same goods.

What is worse, one department will be overstocked with one line while another has work held up for lack of it.

The need for a Planning Department and a single Controller of Cabinet rank to plan output, to arrange priorities, to standardise types, styles, sizes, to co-ordinate distribution has been stressed to the Ministries concerned not by one but by a dozen expert industrialists.

Why is nothing done?

Lord Beaverbrook's quickening touch is not yet apparent. Business men fear his powers may not be wide enough. He is certainly one of the few men who could do the job.

Shop Sales Down Everywhere

SHOP sales figures for April are almost valueless for purposes of comparison. Easter holiday always raises sales and this year Easter fell in April, last year in March.

Comparing the quarter, February—April, we find that total sales in London fell by 12.4 per cent., while in the Provinces they rose by 5.6 per cent. Allowing for a 30 per cent. rise in prices and the affect of the Purchase Tax, sales therefore fell by 52.4 per cent. in London and by 34.4 per cent. in the rest of the country.

Assuming the Ministry of Labour Index at all useful (which it isn't, see below), the provincial dealer must reduce sales by another 13—14 per cent. and quickly.

Significantly, extreme regional variations were less marked than in March,

which means that supplies were a trifle less unequally spread. Even so, non-food sales rose during the month in the South of England by exactly 24 per cent.; for the country as a whole, apparel rose from an index figure of 102 to one of 124. Here again the rise was greatest in the South.

Strangely enough, the sale of household piece goods fell almost as heavily in the North-east as in London. Scotland did not maintain its lead for dress piece goods but did hold it for household piece goods.

Values of stocks rose by no less than 10.5 per cent. although on an average they must have fallen anything from 25—66½ per cent. in volume.

Under the present control and rationing system, it is clear that stocks in the Provinces are being more rapidly depleted than those in London. The coupon system will certainly result in a more even distribution of stocks to population.

What Rationing Will Do

THE Board of Trade is taking care to ensure this by more than one method. No one retail company was allowed, during the period of grace for non-coupon buying, more than 10,000 coupons' worth of goods (£750 to £1,000) from any one wholesaler. This prevented the chain stores from getting ahead of the small shops in the usual way. So more goods will go to the overcrowded small industrial and country towns and fewer to the London and other cities' suburbs, citadels of the chain store.

Further, it will tend to increase sales for the working class dress shop and to decrease them for the high class concern.

Department stores will suffer badly, while more of our valuable model houses may be extinguished. (A peril to our export trade, this).

On the other hand, all classes will tend to buy better clothes. In this way, the lower middle class and a few of the upper, multiples and small shops should benefit.

Cost of Living Index Exposed

NOBODY has been happy about the Ministry of Labour's Cost of Living Index for years past.

To-day rationing has reduced the working-class family's weekly butter by nearly 50 per cent., its bacon by 75—80 per cent., its cheese by over



* Lack of Co-ordination holds up War Production

* A better yardstick is needed to measure the cost of living

* Prices of transport, fuel and labour must not run amok

* It would be wise to drop the concentration of certain specialised industries

90 per cent. and so on. In short, the index is completely out of touch with reality.

Yet the wages of over 2½ million people are directly controlled by the movement of this Index.

But has the rise of around 27 per cent. shown by the index any relevance to the present facts? The *Economist* thinks not. A writer shows that allowing for rising prices and the buying of unrationed food, the average working-class family's expenditure on basic foods used for the index has actually fallen by 19.6 per cent. Yet the index's component for food has risen by 18.4 per cent. Which certainly damns the index.

This error does not mean that the cost of living has fallen for the worker. On the contrary, I am certain it has risen owing to the higher cost of tinned goods and of all food substitutes, to high rents, and to the 50 per cent. all-round rise in the cost of clothes. But by how much? By more than 27 per cent. or by less?

Still No Control of Prices

THE price and wage situation is again getting out of hand. At one moment the Chancellor

solemnly assures us that he will make almost any sacrifice to keep down prices.

The next moment there is a grant to miners of 1s. per shift, or an 8 per cent. rise in wages. The price of coal will be raised by 10d. per ton, adding an additional £8½ to £9 million on the coal bill. The consumer pays, as usual.

True, this bonus was bringing miners' wages more into line with those of munition workers.

What is the use of controlling the price of consumer products like clothing and food stuffs while the strategic prices of labour, transport and fuel are running amok? The price of these services enters into the cost of production of every article.

To allow this continual rise in strategic prices and to talk at the same time of controlling the cost of living is sheer economic lunacy. But what are the business M.P.s in the House doing to educate Sir Kingsley Wood in the realities of industrial economics?

Second Stage of Concentration

CONCENTRATION is now compulsory. I hope that many readers took my tip and got their schemes in immediately after the closing dates. Mr. Hammersley's plea for the cotton trade "that a great deal of confused and contradictory advice caused few voluntary schemes to be submitted" does not apply to readers of this journal. I am still waiting to be caught out in my details.

Concentration under the second stage will not be pleasant. So much is evident. Some firms have failed to realise the danger of missing the best offer, even in trades where 90 per cent. of the production capacity has been dealt with voluntarily.

As I predicted, the B.O.T. has for once tried hard to give a fair deal to the small firm. In the rayon industry, for instance, British Enka is a nucleus whilst Courtaulds have closed down three of their factories.

Real difficulties remain in the pottery, carpet, furniture, jewellery and metal-plating industries. Firms are small, machinery is specially constructed and adapted, runs are short, labour is highly skilled. Here are conditions which offer little scope for forming large factory units, for benefitting by simplified practice and standard products.

Personally, I think that Captain Lyttleton will be wise enough to drop concentration in some of these industries and to concentrate on control of materials, and therefore of output, while keeping every specialised section of each industry alive. One or two luxury industries will be turned over entirely to munitions.

Look West, Old Man!

WANT to forget the war, income tax, rationing, the Ministry of —, and all the rest? Then just look west with me!

America, as her business economists

put it, is on the "up and up" once more. This is even better than "normalcy." After ten solid years of dumps and slumps, industrial production is put above the 1929 boom level and it is not just consumption goods that are booming unhealthily this time.

Commodity prices (Moody's Index) have risen from 175 in February to 196 in the second week of May. Factory employment is up by well over 14 per cent. on a year ago, with by far the biggest rise in durable goods (around 30 per cent.). Factory pay-rolls are up by 27.1 per cent. at the least; con-

struction contracts have soared from an index figure of 63 in March, 1940, to 96 in March last. The average worker is earning about \$3 a week more than he was a year ago.

Strikes are the employers' chief trouble. But they are their only trouble (as we know trouble now)! Incidentally a more realistic appreciation of modern economic necessities by employers would have avoided many of these strikes. Strange as it may seem, many of them are caused by the desire of small employers to retain an open shop. Shades of our grandfathers!

What is an Accident?

*There are more hazards to-day than in peace-time.
Yet many of them are not "War Risks"*

THE term "accident" has been given such wide meaning in legal decisions upon its use in the various Workmen's Compensation Acts that it must be properly qualified to avoid ambiguity as to its scope in an insurance policy.

The hazards of war have attracted the attention of executives to the need for insurance "cover" for themselves and their organisations against risks ignored in more peaceful times. War risks are usually clearly defined, but policies covering them do not include financial protection against accidents not caused by enemy action.

A well-known legal definition of the word "accident" is "an unlooked for mishap or untoward event which is not expected or designed." This wide interpretation might well cover disease as distinct from the class of mishap

colloquially designated as an accident. The policies for Personal Accident insurance therefore qualify the term by stating that the accidental death of injury to the insured must be "by violent, external and visible means."

Personal accident insurance is the only branch of insurance which is not based strictly on the principle of indemnity. The compensation payable on the happening of the event insured against is not measured by the actual financial loss, as in an indemnity insurance.

From the financial side, this insurance has advantages. The whole premium for an accident policy will rank for Income Tax relief, while with a policy giving cover against personal accident and disease a rebate calculated at 2s. per cent. of the capital sum insured will be allowed.

Part-time Women Workers are a Success

(continued from page 10)

In training of these part-timers it was expected they would be substantially slower than the younger and full-time girl under going similar training, but this has not proved to be the case. *Although the average age of our part-timers is over forty-five—some of them are nearly sixty—they required no longer training than the full-timers.* In many cases it was found that a part-timer required little more than the same number of days of part-time training as a younger girl on full time did of whole-day training before being sufficiently proficient to take their places on the production lines.

Absenteeism Is Almost Unknown Among These Women

In the main, the part-timers are employed on light and clean assembly, adjusting and wiring work, as well as on inspection. So keen are the majority of them on their work that absenteeism and unpunctuality do not exist as pro-

blems for the management. This may be partly due to the experience of age, but it is also taken as a sure sign of the keenness of the women.

It is already possible for us to claim that this unusual experiment is a success. There seems no doubt that this company alone, with no publicity beyond that obtained from the natural dissemination between employees and through the valuable help of the W.V.S., could easily engage 100 part-time workers a week, the great majority of whom would not otherwise have found their way into productive war-time work.

From our own observation this experiment, if it becomes widespread, may perform a valuable social function. It should help to break down the antipathy of some social classes to work in industry, by introducing a vast new stratum of the population to modern industrial conditions and to the factory workers.

BUSINESS Guide to War-Time Law

By JOHN BURKE, Barrister-at-Law

Editor: Loose-Leaf War Legislation;

Encyclopædia of War Damage and Compensation

Mr. Burke, one of the leading authorities on business law, prepares this digest to explain briefly every important Act, Order or Regulation coming into operation during the current month. Many hundreds of readers have already been helped by this feature. If you have any problems arising from war-time legislation, not dealt with yet, write to the Editor for information and guidance

The notes which follow cover the period from May 15, 1941. They are arranged in alphabetical order and numbered. A cumulative index is to be found at the end of the feature.

The references in these notes, e.g. S.R. & O. 1941 No. 688 are references to the statutory Rules and Orders of 1941 published by the Stationery Office.

2. Coal

Wholesale coal prices are regulated by S.R. & O. 1941 No. 688.

Work in coal mines is now controlled. Miners may not be dismissed (except for serious misconduct) and may not leave their employment without the permission of a national service officer. A guaranteed wage is to be paid to all miners capable of and available for work who are willing to perform services outside their usual occupation which they can reasonably be asked to perform during any period when normal work is not available. Miners may only be engaged for work through a local office of the Ministry of Labour and National Service.

23. Clothes Rationing

Rationing of clothing was introduced by the Consumer Rationing Order, 1941 (S.R. & O. 1941 No. 701). The rationed goods are (1) cloth, whether woven, felted, knitted, netted or crocheted, made wholly or mainly from any textile other than jute, (2) wearing apparel including handkerchiefs, (3) boots, booties, shoes, overshoes, slippers and sandals, (4) hand knitting wool, being hand knitting yarn containing more than 16 per cent. by weight of wool. Second hand goods are excluded from the order and a number of articles specified in the second schedule to the Order.

Rationed goods may be supplied by traders to retail customers only on surrender of coupons. This does not apply to supply (a) under Board of Trade licence, (b) for Government contracts, (c) by delivery outside or by exportation from the United Kingdom otherwise than in or to the Isle of Man, (d) to a local authority, (e) to the W.V.S.

Within certain limits rationed goods other than cloth may be supplied without coupons by a trader to another trader or to a manufacturer of unrationed goods for the purposes of their businesses up to and including June 21, 1941. Cloth may be similarly supplied up to and including June 28, 1941. After those dates rationed goods can only be supplied against surrender of coupons. This does not apply to supply (a) under Board of Trade

licence, (b) for Government contracts, (c) by delivery outside or by exportation from the United Kingdom otherwise than in or to the Isle of Man, (d) by a person who is a registered trader under the Limitation of Supplies Order in respect of rationed goods to another such person.

A business which supplies uniforms for its staff may obtain the necessary coupons from the staff and use them to obtain the uniforms.

24. Finance Regulations

Under r.6 of the Defence (Finance) Regulations, 1939, it is unlawful in the United Kingdom except with Treasury consent to make an issue of capital or a public offer of securities for sale or to renew or postpone the date of maturity of securities maturing for repayment in the United Kingdom. A person is now deemed to make an issue of capital if he "receives any money on loan on the terms expressed or implied that the loan will or may be discharged or secured wholly or partly by the issue of any securities or by the transfer of any securities issued after the making of the loan, or will or may be repaid wholly or partly out of the proceeds of any securities issued after the making of the loan." The expression "security" includes "a bill of exchange other than a bill payable on demand or at a fixed period not exceeding six months after date or after sight, a promissory note of a local authority, a promissory note payable more than six months after date, a deposit receipt for money but issued by a local authority or by a person carrying on a business other than the business of banking, and a unit or sub-unit of a unit trust." S.R. & O. 1941 No. 649.

The Capital Issues Exemptions Order, 1941 (S.R. & O. 1941 No. 648), which replaces earlier orders on the same subject, exempts certain transactions from the foregoing provisions. The Order exempts transactions involving a consideration which, taken with the value of the consideration involved in previous transactions within the preceding 12 months, does not exceed £10,000. Certain specific transactions are also exempt and they are not to be taken into account in ascertaining whether the £10,000 above mentioned has been exceeded. The most important new specific transaction so exempted is the issue or re-issue of units or sub-units of a unit trust, if the issue or re-issue does not cause the total number of issued units or sub-units to exceed the total number outstanding at the date as from May 12, 1941, including units or sub-units which at that date the trustees could be required

by the managers of the trust to issue.

Reg. 3c of the Defence (Finance) Regulations 1939, restricts the making of payments outside the sterling area without Treasury permission. The General Exemptions under this Regulation are now contained in S.R. & O. 1941 No. 672. Payments to Central America are regulated by S.R. & O. 1941 No. 673.

25. Food

Butter: prices; S.R. & O. 1941 No. 686.
Cheese: control; S.R. & O. 1941 No. 695; processed; No. 697; rationing; Nos. 626, 696.

Cocoa, Chocolate and Sugar Confectionery: licensing and control; S.R. & O. 1941 No. 674.

Coffee: returns; S.R. & O. 1941 No. 627.

Eggs: home produced, prices; S.R. & O. 1941 No. 644; indication of origin of imported; No. 711.

Feeding Stuffs: prices; S.R. & O. 1941 No. 694; rationing; Nos. 628, 639.

Fish: pilchards and herrings; S.R. & O. 1941 No. 708; sardines; No. 671.

Fruit: canned, prices; S.R. & O. 1941 No. 693.

Meat: retail prices; S.R. & O. 1941 No. 746.

Milk: condensed; S.R. & O. 1941 No. 745; restriction of use; No. 657.

Mills and Flour: control; S.R. & O. 1941 No. 737; prices; No. 739.

Oats: control and prices; S.R. & O. 1941 No. 748.

Potatoes: crop control; S.R. & O. 1941 No. 658; prices; No. 659.

Poultry: prices; S.R. & O. 1941 No. 749.

Rice: prices; S.R. & O. 1941 No. 645.

Sausages: S.R. & O. 1941 Nos. 709, 710.

Tapioca and Sago: prices; S.R. & O. 1941 No. 675.

Vitamin C: control; S.R. & O. 1941 No. 676.

Wheat: milled wheaten substances; S.R. & O. 1941 No. 656.

26. Import Duties

For exemptions, see S.R. & O. 1941 Nos. 691, 702.

27. Industry

The Board of Trade have power by order to prohibit the carrying on at any premises in any area of a trade or business of any class specified by the Board if the business was not carried on at those premises at the date when the Board's order comes into operation; S.R. & O. 1941 No. 653, para. 6.

28. Lighting Restrictions

From May 4 to August 10, 1941, the "black-out" period is between one hour after sunset and one hour before sunrise in Scotland, Northumberland, Durham, and Cumberland. In the rest of England and Wales it is between three-quarters of an hour after sunset and three-quarters of an hour before sunrise; S.R. & O. 1941 No. 625.

29. Limitation of Supplies

A new Limitation of Supplies (Miscellaneous) (No. 11) Order, 1941 (S.R. & O. 1941 No. 700) has been issued covering the period June 1, 1941 to November 30, 1941.

Changes are made in classes 3, 6, 7, 8, 9, 10, 15, 16 and two new classes 18 (boots, booties, shoes, overshoes, slippers and sandals) and 19 (hand knitting wool, being hand knitting yarn containing more than 16 per cent. by weight of wool fibre).

The general rules as to registration remain the same but manufacturers omitted from the previous Register must apply again under the new Order. A wholesaler who has been omitted from the Register must apply for registration if he commences manufacture or processing of goods. Small manufacturers must apply again for registration if in any

month they supply controlled goods of any class to a value exceeding £100.

Registration forms are obtainable from the Industries and Manufactures Department 2, Board of Trade, Carlton Hotel, Bournemouth. Completed forms are returnable by June 15, 1941.

A registered person who makes up furskins belonging to an unregistered person can only do so within the limits of his quota for Class 5.

Unrestricted supply of certain classes may be made to hospitals, local authorities, ships' stores dealers and the W.V.S.

A registered person may with the Board's consent transfer the whole or part of his quota to another registered person.

A manufacturer who supplies a registered person with controlled goods whose value exceeds by more than £1,000 the value of goods of the same class supplied between June, 1, 1939, and November 30, 1939, must notify the Board of Trade of the fact within 14 days. A similar obligation is placed upon retailers to notify excess purchases.

30. Petrol Rationing

Petrol rationing is now regulated by the Motor Fuel Rationing Order, 1941 (S.R. & O. 1941 No. 669). The Order follows the same lines as previous orders on the subject with the following changes:

The Board of Trade may forbid the use of coupons for obtaining petrol for any particular class of motor vehicles.

The rules against transferring coupons and as to surrendering unused coupons are tightened up.

Board of Trade officials and the police may ask to see coupons in the possession of any person and may confiscate coupons illegally held.

New application forms for licences and coupons are provided for.

An agreement to supply or to acquire petrol is put on the same basis as the actual supply or acquisition.

The Order, like the preceding Orders, is not confined to petrol; it applies to all liquid hydro-carbons used as motor spirit and to heavy oils used as motor fuel.

31. Raw Materials, Manufactures and Commodities

Fertilisers: control; S.R. & O. 1941 No. 683.

Iron and Steel: control; S.R. & O. 1941 Nos. 667, 668.

Molasses and Industrial Alcohol: S.R. & O. 1941 No. 736.

Paper: S.R. & O. 1941 No. 730.

Sulphuric Acid: S.R. & O. 1941 No. 661.

Wool: control; S.R. & O. 1941 No. 705.

32. Shipping.

A reserve called the Merchant Navy Reserve Pool of qualified but unemployed officers or ratings after Merchant Navy has been formed; S.R. & O. 1941 No. 634.

The functions of the Minister of Shipping have been transferred to the Minister of War Transport; S.R. & O. 1941 No. 654.

No person may enter or offer to enter into an agreement for the use or hire of a ship without authority in writing granted by or on behalf of the Minister of War Transport; S.R. & O. 1941 No. 704.

33. Storage Facilities

The owners of premises in Great Britain which have a floor area of 3,000 or more feet super and which have, at any time since January 1, 1938, been used wholly or mainly, for the purpose of storing articles of any description are required to furnish particulars in writing on a prescribed form to the Controller General of Factory and Storage Premises, Millbank, London, S.W.1.

The following are excepted: premises owned by public utility undertakings, or local authorities; premises used wholly for cold storage, bulk storage of liquids, bulk storage of grain; public warehouses at ports; factory premises; retail business premises; agricultural buildings; see S.R. & O. 1941 No. 670.

34. Trading with the Enemy

For amendments to the "black list" see S.R. & O. 1941 Nos. 622, 741.

Syria and Lebanon are added to the list of countries treated as enemy occupied territories; S.R. & O. 1941 No. 731.

35. Transport

The functions of the Minister of Transport have been transferred to the Minister of War Transport; S.R. & O. 1941 No. 654.

36 War Damage

As to the procedure in Scotland for notifying war damage to land and for making claims, see S.R. & O. 1941 No. 660.

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After a Blitz . . .

Some Salvage Do's and Don'ts

WHO owns a blitzed building? The destruction of large numbers of factory and office buildings by enemy action has raised the questions of who owns the smouldering mounds of rubble and burnt stocks and what can be done to secure the maximum compensation for the losses sustained. A full description of the methods of claiming compensation for air raid losses was given in the May issue of *BUSINESS* (Guide to War-Time Law, page 22), but many firms want to know just how they stand regarding the ruined buildings of which they were the freeholders.

To establish a nation-wide scheme for dealing with blitzed property it was necessary for powers to be given to local borough councils, county councils, the Ministry of Home Security and the military authorities, and, in general, it may be considered that a building, smashed by a bomb, belongs not to its original owners but to the Government, with the local council acting as disposal agents.

The actual position is still somewhat vague, since no one has yet disputed the rights of the Government to clear a demolished building. No doubt the proprietor of a damaged structure could claim that the debris was his. If he could make effective arrangements to dispose of his rubbish, no authority would be likely to dispute his claim.

Questions naturally arise as to what a property owner is allowed to salvage. The same course as that adopted in the case of an ordinary peace-time fire must be followed. Nothing should be removed from the blitzed premises, unless in danger of destruction, except with the approval and under the supervision of a Government official or assessor, and then a careful list of all salvaged property must be kept.

Building materials are divided into seven rough groups, and what happens to these in London will provide an idea of the general scheme in force all over the country. Of the seven groups, only two may be considered as being sources of profit from salvage. The cost of demolition and removal of the other five types will more than absorb their value. The seven divisions are:

RUBBISH—including burnt stock and hopelessly smashed building material. This is taken to Thames wharves, loaded into barges and dumped in the Thames estuary.

BRICKS that are not too badly smashed are cleaned, graded and stored until they can be found a new sphere of usefulness.

WOOD too small for any practical use is issued as firewood to people who apply to the local town hall. Serviceable beams are converted into struts and used for shoring up trenches and shelters.

METAL is the most valuable thing in the debris and, when recovered, all goes to the scrap heap.

GLASS is usually too hopelessly mixed with other rubbish to be worth sorting out.

CONCRETE and **STONE** are broken up for road making hard-core.

SLATES, if not badly damaged, can be used for patching roofs.

Of the contents that can be recovered from the building, the owner is allowed to remove all furniture and fittings that can be reclaimed. Stock may also be claimed, and here the owner is entitled to claim for damage under the commodity insurance scheme.

Food may be removed provided the local food officer passes it as fit for human consumption. If it is not passed, it is destroyed.

A.R.P. for the Factory and Office

How to Avoid Factory Black-Out Accidents

Emergency Lighting Sets can Obviate Power Break-down Difficulties

THE general adoption of the spotter system in factories, to enable production to continue during an Alert, has resulted in a number of factory accidents only indirectly connected with air-raid damage.

The cause of this: A bomb on a power station or high tension cables, several miles away, can plunge a whole factory into darkness—yet no immediate danger may be apparent to the spotters. A few minutes later the spotters sound the "imminent danger" signal, but the employees now have to grope their way to the shelters in utter darkness. As a result, serious accidents occur through workers stumbling over castings in foundries, crashing into shafting, machine tools, stores etc.

A leading firm of electric lighting manufacturers have applied their specialised knowledge of emergency lighting to the solution of this problem and have designed an efficient system which can be adapted to the varying requirements of different industries and works layouts. Not only does this system safeguard the workers; it also enables essential production to be maintained in certain parts of the factory where the emergency lighting is sufficient.

Naturally every job presents its own problems and must be treated

individually, but the general design of the system is such that it will enable the maximum lighting to be available in an emergency for the minimum cost of installation and maintenance.

A typical installation has a battery capacity sufficient for supplying emergency lighting for approximately three hours. For recharging the battery a rectifier is supplied which is contained in a sheet steel cubicle arranged for floor or bench mounting.

Lighting Comes on Automatically If Power Breaks Down

The lighting set is equipped with changeover contractors, arranged across each phase of a three-phase supply, so that on a shut-down of the mains supply on any one phase, that portion of lights controlled by the contractor immediately comes into operation. Should a failure occur on all three phases the whole of the emergency lighting circuits would automatically come into operation at once. The set is also fitted with a discharge switch to enable the emergency lights to be switched on manually if required.

After the emergency lights have been used it is only necessary for the battery to be charged for a few hours, even if it has been fully discharged. The only maintenance required is the very occasional topping up of the batteries.

In this regular feature ways and means of improving the A.R.P. organisation are discussed for the benefit of Executives in charge of A.R.P.

Readers of **BUSINESS** are invited to send their A.R.P. queries to the editor. Information on every aspect of Civil Defence is available

Are You Neglecting Anti-Gas Precautions?

THE vast majority of factory managements are neglecting one of the most important parts of their A.R.P. obligations.

Two months before the outbreak of war in July, 1939, every factory employing over 30 workers was advised as to the Government's requirements for A.R.P. instruction to their staffs.

These duties were divided into three parts, viz: first aid, fire-fighting and anti-gas measures. The blitzes of the early autumn of 1940 caused most firms who had neglected to carry out these instructions to institute elementary first-aid and general A.R.P. courses among their staff.

It will apparently need a bad gas raid to stress the vital importance of anti-gas measures. Ninety-five per cent. of the factories liable to take these precautions have, according to the Ministry of Home Security, completely neglected to arrange any instruction on this subject for their workers.

It is understood that stern steps will be taken in the very near future unless there is an all-round indication that the training is no longer being neglected.

Is it Going to Unload ?

Solving the Factory Spotter's Problem of "Imminent Danger" Warning

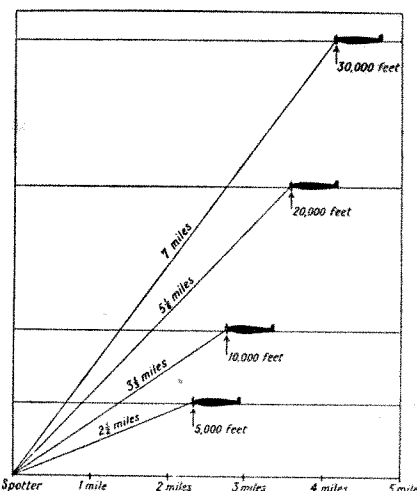
A SKILFUL spotter is a man who can tell (1) whether an approaching plane is an enemy, (2) whether he or his spotting area is likely to be bombed, and (3) whether enemy planes are *not* likely to drop bombs on him or his spotting area.

How to be able to answer these three vital questions with a fair degree of accuracy is one of the main subjects of "Night and Fire Spotting" by Francis Chichester, (London: George Allen & Unwin Ltd., 2s. 6d.).

It is most unusual for a bomber to locate a specific target easily at night, is one of the points Mr. Chichester makes. It is hard enough on a fine day to spot most targets in time to bomb them on the first run in; at night it is practically impossible. Allowing a 250 m.p.h. bomber 15 seconds in which to aim his bomb sight after sighting his target, the beeline distances (as distinct

target in order to hit it, are :

Flying at :	Beeline distance :
5,000 feet ...	2½ miles.
10,000 feet ...	3½ miles.
20,000 feet ...	5½ miles.
30,000 feet ...	7 miles.



from the horizontal distance of the target from a point vertically beneath the plane) at which he must spot his

If The Bomber Comes Back There Is "Imminent Danger"

The shortest of these distances is a long way from which to spot a building even on a fine night. Assuming, therefore, that the spotter is at some target not easily located by a nearby landmark, the enemy must cruise around overhead until he has identified it. He must then turn away and fly off 5 miles or more, according to his height, in order to obtain a straight run-up to the point at which he must drop his bombs.

Consequently, a spotter who hears a heavy plane cruising around or to and fro in his neighbourhood can surely take it for an enemy. And if he hears it first cruising, and then flying away five miles and finally flying back on a straight course, he must anticipate the worst—that it is going to unload.

What the New FACTORY LIGHTING Order Means to You

GOOD lighting means health, safety, speed in work, accuracy. Bad lighting means fatigue, risk of accident, a lowered output of a poorer quality. In peace time these are important matters; in war-time, with the whole nation keyed up to its most intensive effort, they become vital and are neglected only with peril.

It has always seemed to me rather strange that, inasmuch as the eye is the most important and most used organ in doing productive work, full recognition of good lighting as an essential factor in industrial environment was very late in coming. Perhaps this is due to the fact that the effects of defective lighting are not immediately apparent or felt, so that conditions bad in this respect are more readily tolerated than those bad in others.

Peace-time Standards Are Not Enough For War Conditions

At all events, whatever the reason, there was no statutory requirement that good lighting should be provided in factories generally until July, 1938. At this date, recommendations were submitted by the Government Committee on Factory Lighting as to the actual standards that should be adopted—standards formulated, of course, for normal peace-time conditions.

Factory hands are seriously handicapped unless factory eyes can see the work clearly, quickly and easily. Valuable lives may depend upon the quality of a product. Good vision and lighting not only reduce the risk of faulty workmanship, but enable inspectors to detect small departures from required standards

by Sir DUNCAN WILSON, C.V.O., C.B.E.

Chairman, Departmental Committee on Lighting in Factories; Chairman, Industrial Health Research Board; Formerly Chief Inspector of Factories (Home Office).

With the advent of war, the need for greatly improved lighting was intensified. In war-time work is carried on for longer hours, often under black-out or semi-black-out conditions, and there is a big influx of workers new to their jobs, many of them women who have never been in a factory before, or elderly folk whose eyesight is less adaptable than in their youth. For these reasons every hindrance to production must be removed, whether due to lack of speedy

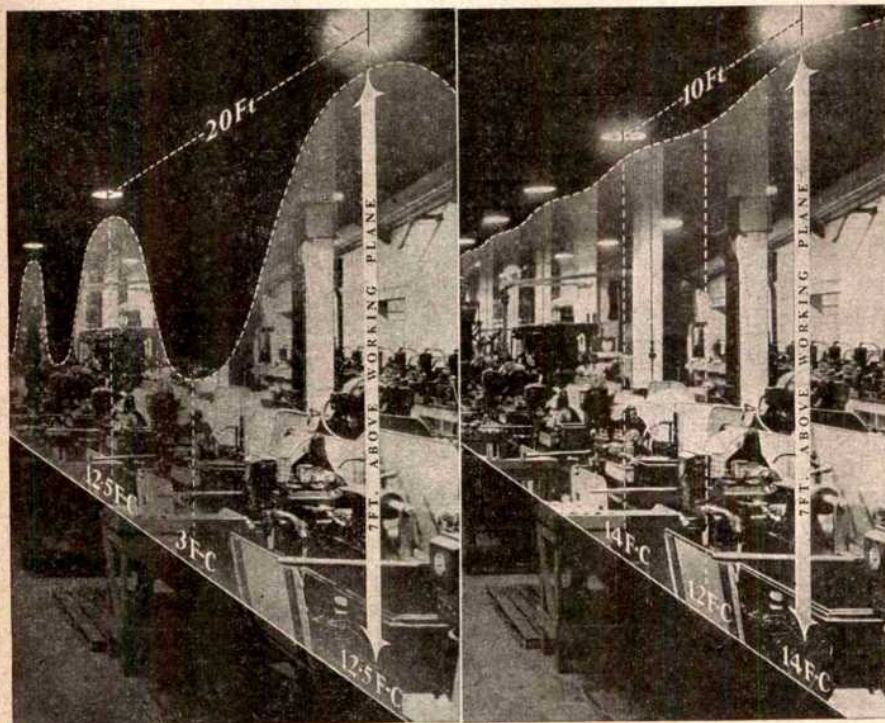
vision or depressing working conditions, which are so often the incipient cause of "lost time."

New High Standards For All Types Of Factories

The Committee on Factory Lighting recognised these facts and in their latest report submitted new standards. So important were the points raised in this report considered to be, from the point of view of welfare and production, that the Government has just introduced legislation making certain standards of lighting compulsory in every factory working more than 48 hours per week. Even prior to the introduction of this legislation, certain vital factories were called upon to conform to specified high standards of lighting under powers granted to the Ministry of Supply.

The principal clauses of this new legislation—the Factories (Standards of Lighting) Regulation, 1941, Statutory Order No. 94, are: Clause 2A—regulation dealing with the minimum general illumination over all working areas; this is laid down as six foot-candles, and it should be clearly recognised that this illumination is elected for welfare purposes only, and is without prejudice to any additional illumination required by the nature of the work. The additional illumination is dealt with under: Clause 2C—calling for that "sufficient and suitable" illumination which was laid down in the Factory Act of 1937.

It must be remembered that these values of illumination were advocated in times of peace. Under the stress of war conditions, with long hours of work under artificial light and the need for the greatest quantity and highest quality of production, it may well be (please turn to page 24)



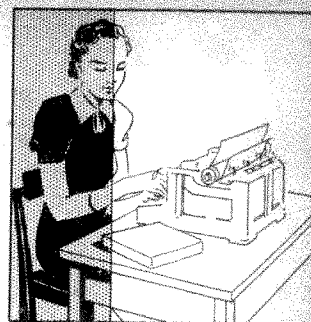
Good and bad factory lighting. If the recommended ratio between spacing and mounting heights is exceeded, dark patches and shadows will be formed, as on the left. Correct spacing and mounting heights, on the right, give an overlap of light which softens shadows and ensures uniform illumination



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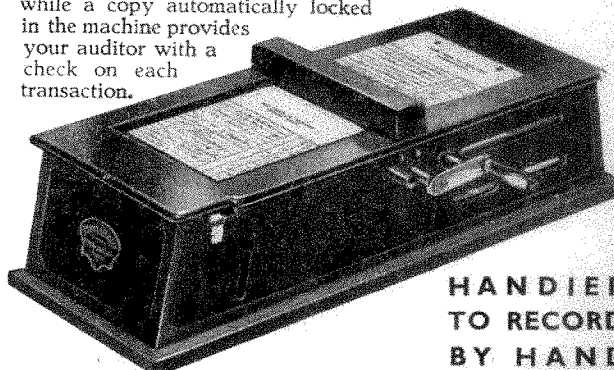
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How to Meet the New GOVERNMENT LIGHTING STANDARDS

THE new Government Lighting Regulations need not impose a heavy cost on factory managements. Often the existing lighting system can be adapted at very low cost to comply with the new standards set up. In others, the adoption of electric discharge lamps, which are much more economical in operation than the tungsten filament type, offer a solution which will save its cost in a few months.

It cannot be too strongly emphasised that the standard set for all factories of six foot-candles must be considered a welfare level of illumination, for the regulations clearly state "the illumination shall not be less than six foot-candles without prejudice to the provision of any additional illumination required."

Diffusing Visors Overcome Reflection Difficulties

Six foot-candles is only sufficient illumination for simple tasks. For more critical tasks higher illumination values must be employed to obtain satisfactory results.

The regulations regarding the cut-off angle and maximum permissible brightness of fittings can be met by the use of standard dispersive reflectors. The high efficiency and wide distribution of light of this type of reflector makes them suitable for the majority of industrial interiors with low or moderate mounting height.

In a number of industries, however,

part of the manufacturing process entails work on polished or shiny surfaces. In order to avoid annoying or disabling reflections from these surfaces, industrial diffusing reflectors should be used or alternatively standard dispersive reflectors should be fitted with frosted or opal glass visors. The effect in each case will be to reduce the intrinsic brilliancy of the light source by spreading the light over a large area.

The use of fluorescent mercury lamps, described in detail in *BUSINESS*, March, 1941, will frequently achieve the same object, assuming they are otherwise suitable to the factory.

Careful Mounting Can Prevent Awkward Glare

Glare is obviously regarded by the Government as bad a fault in factory illumination as insufficient lighting. The new regulations order that where any light source in a factory is less than 16 feet above floor level no part of the source or fitting having a brightness greater than 10 candles per square inch shall be visible to any person whilst normally employed within 100 feet of the source, unless the angle of elevation

from the eye to the source exceeds 20 degrees.

When re-designing an existing installation or making plans for a new one, care should be taken to ensure that the lighting fittings are mounted sufficiently high to avoid the discomfort and disability which are experienced if a large volume of light is installed too close to the eye level. The following table indicates the minimum heights below which fittings should not be mounted:—

ANSWERING—AT WHICH HEIGHT SHOULD THIS LAMP BE MOUNTED?

WATTAGE AND TYPE OF LAMP				Minimum Mounting height above floor (in feet)
Sodium	Tungsten	Mercury	Fluorescent-Mercury	
—	60	—	—	8
—	100	—	—	9
45	150	—	—	9
60	200	80	80	10½
85	300	125	125	12
140	500	250	—	14
—	750	—	400	17
—	1,000	400	—	20
—	1,500	—	—	24

These recommendations are for standard dispersive reflectors or open type reflectors. If, for some special reason, lamps are employed at mounting heights materially less than those given in the above table, industrial diffusing fittings, diffusing cover glasses or other suitable means should be employed.

Waste Avoided by Adopting Existing Installations

Better lighting does not necessarily mean a complete new installation. In many cases it is possible to extend or adapt the existing one and so conserve materials and labour. For example, where the illumination is insufficient one means of obtaining an increase is to interspace a second installation so that the two together provide the desired result. An alternative is to change the reflectors and lamps from say 200 watts to 300 watts and use existing points and wiring, assuming the latter to be of sufficient size. In this case, care should be taken to

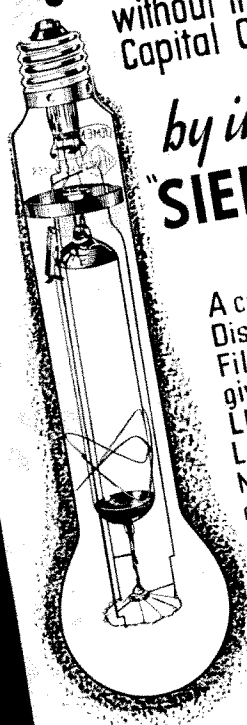
(please turn to page 24)

ADEQUATE ILLUMINATION VALUES FOR INDUSTRY

Class of Task	Recommended Foot-Candles
Precision work to a high degree of accuracy, tasks requiring rapid discrimination and response	above 50
Severe and prolonged visual tasks, discrimination or inspection of fine details of low contrast	25 to 50
Prolonged critical tasks, proof-reading, fine machine work and fine assembling	15 to 25
Visual tasks, such as office work, sustained reading and medium bench work	10 to 15
Less exacting visual tasks, such as large assembly work	6 to 10
Work of simple character not involving close attention to fine detail	4 to 6
Casual observation where no specific work is performed	2 to 4

The fifth report of the Departmental Committee on Factory Lighting specifically draws attention to the schedule of illumination values published by the I.E.S. summarised above. These standards have been compulsory for some time in many Government factories

? How can I improve my
FACTORY LIGHTING
without incurring high
Capital Cost?

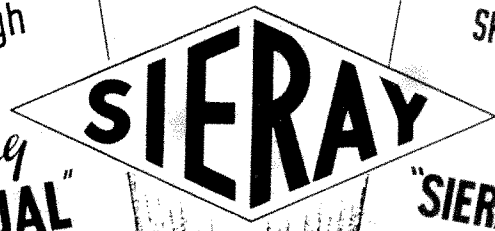


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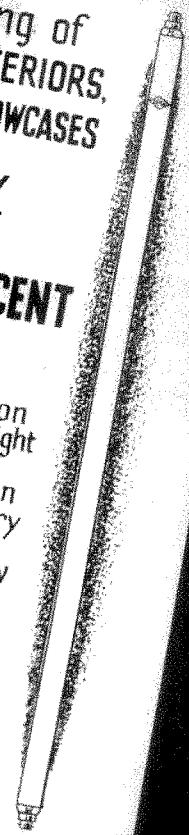
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WHAT IS A FOOT-CANDLE?

The foot-candle is the unit of illumination. It is defined as the light flux density on a surface one foot distant from the source of one standard candle. The foot-candle is not directly related to the wattage of the lamp providing the light, nor is it the same as the candle power of that lamp. For instance, a 25-watt lamp might give 20 foot candles of illumination on a book held one foot away from it. But if the book is removed to a distance of two feet, the illumination falls to perhaps 5 foot-candles. If a shade of any kind of fitting is placed over the lamp, the illumination may again fall or it may rise, depending on the type of fitting.

ensure that the larger lamps are mounted sufficiently high to avoid glare.

Since it is desired that, in the interests of national economy, capital cost of installation and the use of materials should be kept to the minimum necessary to ensure satisfactory results, it would appear, at first sight, to indicate that the use of electric discharge lighting would rarely be justified.

Six Points In Favour Of Discharge Lamp Installations

In practice, however, there are liable to be costs other than those of the actual fittings and lamps incurred in re-arranging existing lighting installations. It is, therefore, suggested that electric discharge lighting may be used where it would have been adopted in peace-time, provided that the following circumstances apply:—

(a) Where the installation of such lighting would obviate alterations and additions to existing wiring, which would cost as much as the extra over a tungsten installation or would lead to serious delays and disorganisation in the factory.

(b) Where the extra heat dissipated by additional tungsten lighting would impair the efficiency of the ventilation system.

(c) Where a factory is already lit partly by discharge lighting.

(d) Where a factory is lit with tungsten lighting but additional points are required, and such additional points if carried out with discharge lamps would not involve increasing mains, switchgear, etc. while the corresponding installation of tungsten lighting, giving the same increased intensity, would involve such alterations.

(e) Where the overall savings due to reduced current consumption of an electric discharge installation would recover the extra capital and lamp replacement costs involved within two years.

(f) Where discharge lighting has definite and accepted merits for the solution of a special lighting problem.

The Mercury-Tungsten Dual Lamp Has Many Advantages

It will be of value here to mention one of the most modern developments of light sources that is contributing much to the efficient lighting of factories. This is the dual mercury and tungsten lamp, which consists of a highly efficient mercury discharge lamp supplemented by a normal tungsten filament. This combination of principles introduces important advantages. Incorporation of the tungsten filament does away with the need for the choke or condenser normally required for discharge lamps. Secondly, the filament imparts to the light the red rays in which the discharge lamp itself is deficient. The result is a light which, while having the power and special visual qualities for which the discharge lamp is well known, has also the "corrected" colouring which is more satisfactory to the eye.

Improved Lighting Will Mean Increased and Better Production

The one and only aim of a factory lighting installation should be to enable the operatives to see clearly, quickly and easily the objects on which they have to work. Close observance of the new regulations will do much to sweep away the low standards of artificial lighting which have, in the past, made workers' vision less certain, less rapid and a great physical effort, with resultant bad effect on production.

What the New Factory Lighting Order Means

(Continued from page 20)

that even these standards might with advantage be increased. For this reason, it is recommended that where work of national importance is concerned, values at the upper end of the scale set out by the Illumination Engineering Society and the Electric Lamp Manufacturers Association, should be adopted.

The one and only aim of a factory lighting installation should be to enable the workers to see clearly, quickly and easily the objects on which they have to work.

It is an easy matter to make out a case for good industrial lighting on the grounds of greater quantity and quality of production alone, but there is a further factor to which more and more importance is being attached as time goes on—namely, the effect which lighting conditions have on the workers themselves.

Better Vision Gives More Energy More Safety

It is not often realised how much human energy is expended in the act of seeing. Since seeing seems to be almost an automatic process, there is a tendency to assume that it involves little or no effort, yet it is probably true to say that a man who spends his day using his eyes under poor lighting conditions ends up by being more physically tired than a man who spends his day digging ditches.

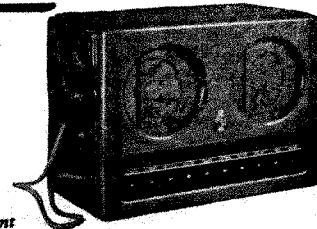
The waste of nervous energy at low levels of illumination is very marked, while the actual energy turned into useful work is at a minimum. As the lighting level is raised, not only is more energy transformed into useful work, but at the same time the wasted nervous energy is reduced at an even greater rate.

In other words, with better lighting, the workers automatically have a greater human factor of safety, and a reserve of energy which enables them to carry on to the end of a long day and to put forward any special effort needed at any time.

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THESE R.A.F. FITTERS ARE GIVEN NON-SHRINK OVERALLS



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**Your staff will work better, be healthier,
look smarter in protective clothing that
doesn't get smaller when it's washed**

YOUR staff is probably doing just as important work these days as that of the fitters and riggers of the R.A.F. Like them, they have to be able to move fast, to use their arms freely, to bend quickly, and to breathe without restriction. They too need to be efficiently protected from grease, dirt and oil in the shops or workrooms.

Overalls that *shrink* neither give workers efficient protection nor allow them to do their jobs efficiently.

This fact has been recognized by the War Office. They specify a standard of shrinkage control

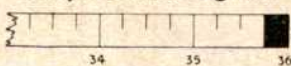
for overall cloths and cotton service uniforms worn by the Forces. This standard is a very high one. It allows for no more than $\frac{1}{2}$ of 1% shrinkage in length or 2% in width.

The diagrams below show the wide margin of difference between many so-called shrunk overall cloths and "Rigmel"-Shrunk. They emphasize, too, the importance of getting "Rigmel"-Shrunk overall cloth when buying for factory staffs.

You will find your staff are healthier, look smarter, and work better, in overalls that don't shrink. And they are an economy because they need fewer repairs and replacements.

Why not see your suppliers about "Rigmel"-Shrunk cloth? Protective garments in it are also available through retail outlets for purchasers of small quantities.

Compare these diagrams



Overall cloth that is "Rigmel"-Shrunk won't shrink by more than a fraction of an inch in the yard.



Some so-called "shrunk," "fully-shrunk" and "guaranteed un-shrinkable" overall cloths shrink by as much as 2 inches in a yard.



"Rigmel"-Shrunk

Laundry-tested
against Shrinkage

REGD

Advertisement of THE BRADFORD DYERS' ASSOCIATION LIMITED
LONDON · BRADFORD · MANCHESTER

Don't Black out the SUN



Just as the sun furnished every horse-power unit used in the factory (scientific fact!), so sunshine provides all the energy your workers put into the job. Now that the national effort makes people give up holidays, curtail sleep, work over-time in blacked-out factories and offices, they lose energy and get over-tired. That makes sickness, absence, accidents rise while output and wages drop.

Don't black-out the Sun! Install Hanovia Welfare Sunlamps at the Works and give your people vitalising sunbaths. (Take them at home yourself if you like with a "Homesun"). Brief regular sunbaths keep men fighting fit; lower illness and absence by 30% and 40% (actual records!).

"This war will be won in our work-shops," says Mr. Bevin—and Hanovia Sunlamps are helping the Fighting Units and factories of Britain to make the winning effort.

We offer our booklet "Fitness in Industry" freely to employers, factory Medical Officers and Welfare Supervisors. Send for your copy now.

The Industrial Welfare Department,

HANOVIA LTD., SLOUGH.

London Showrooms: 3 Victoria Street, S.W.1.

Hanovia Sunlamps are helping in the war work of:

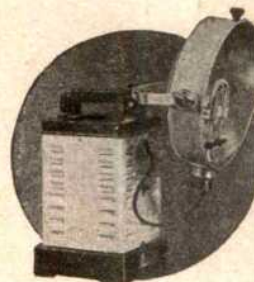
Armstrong Siddeley Motors Ltd.
Aspro Ltd.
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The Hanovia Welfare Sunlamp for tonic ultra-violet sunbaths indoors.



COUPON To: Industrial Welfare Dept.,
HANOVIA LTD., SLOUGH, BUCKS.

Send me facts about indoor tonic sunbaths required (for

..... employees)
(for personal use)

Name

Address

Women are Handling Trucks Now . . .

Nimble runabouts can speed factory internal transport and release skilled men for important jobs



YOU wouldn't think of putting women on to the work of shifting heavy loads about the works, would you? And yet that is one of the jobs they can do—and like! Of course, they can't lift and carry heavy loads. Why should they? Why should anybody, when by using a special truck with stillages (or loading platforms), one girl can do the work of ten men—without leaving the driving seat.

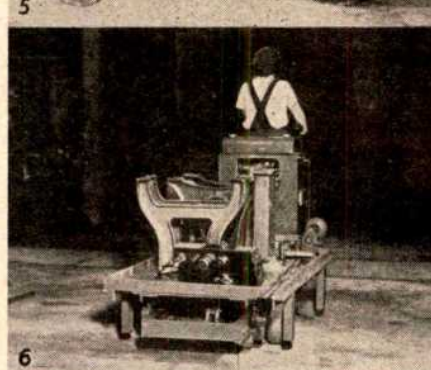
A slip of a girl, looking as though a stiff breeze would blow her away, can back up her truck to a TON load,

An unskilled operator can easily manoeuvre her truck under a loaded stillage and lift it (1, 2 and 3), run it to its destination (4), back the truck (5) and lower platform (6) to release the load

touch a lever which lifts it clear of the ground, and drive it to wherever it is wanted.

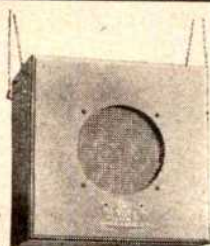
And do the girls like the job! It's just the thing to delight the modern girl. No mechanical aptitude is required, and this is a good thing, as very few women are mechanically minded. And the variety and change keep them interested. Here is no dull, repetitive job, tying them to a bench in one spot, but a lively sociable job, bringing them in touch with their fellow-workers all over the factory; a little bit of back chat here and there as they bring the men the loads they want on their jobs all helps to pass the time pleasantly while they are actually on the job.

Simplicity of control helps the girl driver of trucks such as that illustrated. One of these novel features is the patent reversing gear, which is effected by rotating the steering wheel through



180 degrees. To reverse, therefore, there are no levers to operate and no gears to engage. To ensure that the driver knows in which direction she will move on engaging the clutch, there are coloured discs, red for reverse and white for forward, on the base of the steering column.

One final point of interest to the works management—the operating costs are just over a halfpenny per ton mile.



Box-type factory speaker

MUSIC SPEEDS PRODUCTION

RELIEVES MONOTONY • BANISHES DEPRESSION • EXPELS FATIGUE

Government departments, supported by the B.B.C., are urging the broadcast of music in industry to speed up production. Already many large firms are using Dictograph Sound Installations. Information, demonstration, survey, estimates, or rental terms—free on request. Twenty-five years' experience at your disposal in manufacture, installation and maintenance. A test gladly arranged in your own works.

DICTOGRAPH SOUND INSTALLATIONS

(Dictograph Telephones Limited)

ABBEY HOUSE, WESTMINSTER, S.W.1

AURELIA ROAD . . . CROYDON

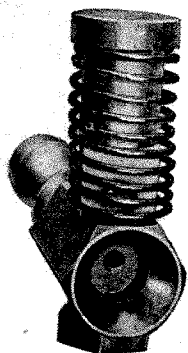
Abb 5572 (3 lines)

Tho 2427 (2 lines)

Branches at BIRMINGHAM • MANCHESTER • GLASGOW • LEEDS • NEWCASTLE • BRISTOL • CARDIFF

FOR MUSIC IN FACTORIES • STAFF LOCATION
CONTROL OF STAFF DURING AIR RAIDS • MASS
ADDRESS TO EMPLOYEES • ACCIDENT, FIRE,
BURGLAR AND SABOTAGE ALARMS • AIR RAID
WARNING DETECTOR

It must be **SPRAY!**
.... it IS spray, if your



Stirrup Pump has
a **WOODHOUSE S.L.
Spring-Loaded Nozzle**

Every fire-fighter knows the danger of putting a straight jet on to a blazing bomb. Yet haste and excitement can easily cause this to happen with the ordinary nozzle. With the **WOODHOUSE S.L. NOZZLE** such mistakes are **IMPOSSIBLE**. The normal position gives the spray. To obtain the jet the spring must be depressed with the thumb, and immediately the spring is released the spray is again in operation.

With the Woodhouse S.L. Nozzle, you are **certain** to get the spray unless you want the jet.

Write for details of this and the **WOODHOUSE INCENDIARY BOMB CONTROLLER**, also of **FIRST-AID HAVERSACKS AND POUCHES**.



WOODHOUSE
PRODUCTS LIMITED

Registered Office and Works:—

108 CRICKLEWOOD LANE, LONDON, N.W. 2.

Telephone: GLAdstone 7093.

DHB

PRODUCTION CONTROL

A system that was recently referred to in the "Factory Manager" as one of "the most flexible and modern Factory-work record systems available" is the

27
0287
356
12
1/1

MACHINING

INTERNATIONAL TICKETOGRAPH SYSTEM OF PRODUCTION CONTROL

It will maintain operation costs already fixed in advance, and it will show the position of every job as it proceeds through the Works

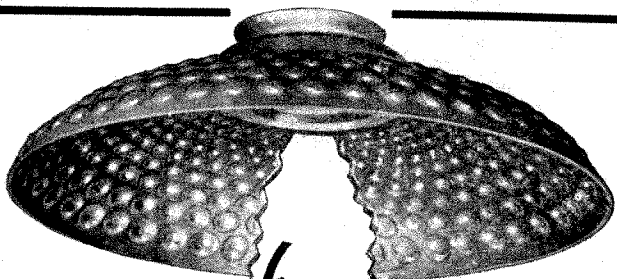
Full information gladly sent without cost or obligation. Write or Telephone—

INTERNATIONAL TIME RECORDING Co. Ltd.
112 Strand, W.C.2. TEMple Bar 5841

Head Offices: International Works, Beavor Lane, W.6

B317-5

"MARLEY" SECRET OUT!



ENLARGED
SECTION

Method of
Construction—

BLUE GLASS

WHITE GLASS

SILVER DEPOSIT

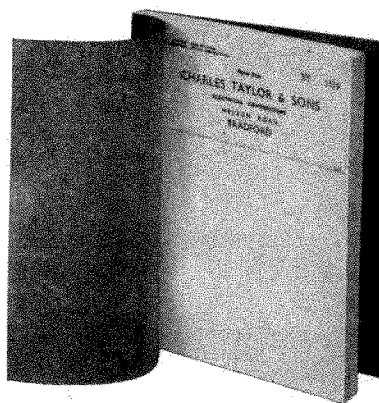
COPPER DEPOSIT

ALUMINIUM FINISH

SEND FOR
A COPY OF
"SEE
THINGS IN
THEIR
TRUE
LIGHT"
NO CHARGE

This scientific reflector, incorporated in every **MARLEY LIGHTING UNIT**, turns artificial lighting into a restful pale white light eliminating eye-strain and promoting health and efficiency. It can effect an economy in current consumption up to 50% and requires standard pearl lamps of low wattage only... installation costs are small. An interesting fully descriptive and illustrated book awaits your application—it should be studied by every business executive.

MARLEY LIGHT COMPANY LTD.,
3 Byron Road, Harrow, Middx.



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TRAVELLERS' BOOKS
STOCK BOOKS
ORDER BOOKS
RECEIPT BOOKS
INVOICE BOOKS
DELIVERY BOOKS
POSTCARD BOOKS
ON APPROVAL BOOK

Wilkes Duplicate Books

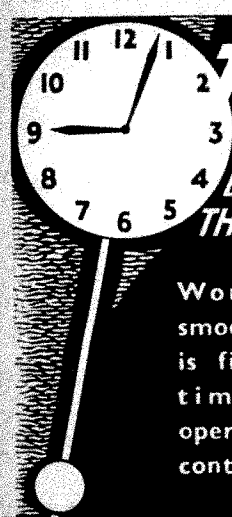
Duplicate, Triplicate, Quadruplicate, Quintuplicate: sewn, stapled, limp covers or stiff bound, there is a book in our range to suit your every need.

We make them in thousands for the big users, and in fives and tens for the smaller man—all with the same care and attention, from the machine that casts the type, to the wire or thread which binds the book together.

James Wilkes Ltd

Printers Serving To-day's Commerce

MOXLEY ROAD WORKS, BILSTON



TIME
IS THE
ESSENCE OF
THE CONTRACT

Work flows smoothly and is finished on time when operations are controlled by

Gledhill-Brook TIME RECORDERS

Write for details of Equipment and Service:

GLEDHILL-BROOK TIME RECORDERS LTD.
Dept. 38, Empire Works, Huddersfield.

Old Posters, Showcards, made new with

TRAPINEX

Paint PRINTING in brilliant relief effect

The "TRAPINEX" Paint Process can achieve truly amazing results in changing imperceptibly old brands, designs or prices on show cards, posters, containers and all advertising and display material made obsolete by Purchase Tax or restricted sales.

Look out your obsolete material and send us specimens for quotation and treatment to show the brilliant results.

BLITZED WINDOWS

You can counteract loss of display due to the 'Blitz' by using "TRAPINEX" PAINT TRANSFERS. With these, anyone can apply your advertisement in brilliant PAINT direct on to any board as easily as on glass. Unlike paper, "TRAPINEX" PAINT will not wash off or get soiled but will provide you with lasting publicity, and at night will defeat the blackout—reflecting every glimmer of light from dimmed street and car lamps, torches, etc. Ideal for export, being light in weight.

Phone or send for details—

TRAPINEX LTD.
8 Commerce Works,
43 Commerce Rd., London, N.22

BOWES PARK 2689

New for The Office Lighting Advertising Factory ARP

1 CATALOGUE COVERS AS ENVELOPES

One firm has solved the problem of retaining a serviceable cover to its monthly catalogue and price list—a much thumbed work of reference to the retailers concerned—by fitting it with a small flap and incorporating a space for an adhesive label in the cover design.

A typed label, which seals the flap into place, converts the catalogue cover into a stout envelope. This enables the firm to save the cost of many thousands of large envelopes or wrappers each month and also the wastage of much valuable paper.

2 BLITZED WINDOWS AS ADVERTISING SITES

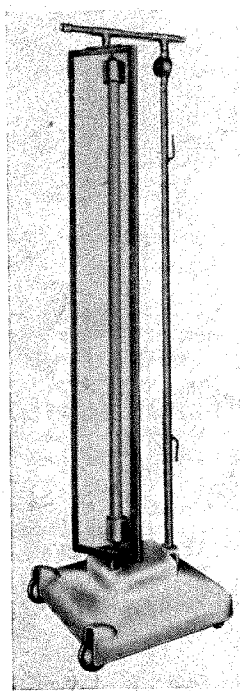
Well-made wood and glass window pieces, complete with stout wooden shutters to protect the glass section against blast, are being supplied free to retail chemists by a leading firm of manufacturing chemists.

The return for this cost is to be found in the solus advertising sites which remain the property of the firm fitting the windows. One or two spaces remain visible all the time, while two others, one on each shutter, catch the eye when the displays are open.

This form of publicity is adaptable to practically any trade and can do much to replace the lost poster hoardings, now unusable because of paper restrictions.

3 PORTABLE FLUORESCENT LIGHTING

From the industrial workshop point of view, the "Portalux" lighting unit for 5 ft. 80 w. fluorescent discharge tubes is one of the most important recent developments in the lighting field. By reason of its portability and adaptability to vertical or horizontal position, the "Portalux" enables artificial daylight to be brought up to or placed under the work. It is the equivalent of turning a five foot tube into a hand inspection lamp.



In aircraft factories, for instance, it will enable the nearest approach to daylight conditions ever achieved artificially to be introduced right into the fuselage or under the wings in the horizontal position or right up to any working face with the vertical or horizontal positions. It should prove an inestimable boon in auto-

•Readers are invited to make use of this valuable information. The name and address of the manufacturer of any product described may be had on application to the Editor, **BUSINESS**, Whitefriars House, Tallis Street, London, E.C.4. To simplify your request you may refer to the items by number only.

•Manufacturers and distributors are invited to send complete information about their new products for inclusion in this feature.

mobile factories, where the difficulties of applying adequate light in awkward positions is a constant problem.

The unit has been designed on rugged lines to withstand hard usage. It consists of a trough reflector carried in a tubular steel frame, which is mounted on a heavy cast iron base. The reflector is made from sheet steel.

The lighting unit is entirely self-contained and, on site, requires only the fixing of the three-core supply cable to the switch terminal.

4 ADVERTISING "SITS. VAC." ON HOARDINGS

A number of hoarding sites in London suburbs are being put to use for a new type of poster advertising. The District Messenger Co. started in May to use posters to advertise for new staff. A big catering firm quickly followed by booking a number of sites for similar "staff wanted" advertisements.

5 STANDARD BRICKS IN TWO SIZES ONLY

Sizes in which the common brick is manufactured are to be reduced from 17 to two, under an arrangement between manufacturers in England and Wales, in co-operation with the Ministry of Works.

Users of bricks are requested to work to the two standards and to avoid demands for sizes now obsolete.

6 EMERGENCY FACTORY LIGHTING

A battery lighting set, which automatically comes into operation if, for any reason, the mains supply fails, has been developed by a leading electrical manufacturing firm (see page 19). This type of installation will be particularly valuable to factories which continue to work through Alerts.

"IMMEDIATE ACTION, PLEASE"

They want War Jobs

THERE are over 6,000,000 women employed in the factories and offices of this country. There are 1,409,000 women directly helping Britain's war effort in the A.T.S., W.V.S., A.R.P., etc. But 165,000 are still on the Ministry of Labour's registers as unemployed.

These women are not just enthusiasts who want to help in the war effort. Most of them, of course, are anxious to play their part, but many of them have had industrial experience and are skilled factory workers.

The W.V.S. are successfully co-operating with factory managements (see page 10). A substantial proportion of these idle thousands could realise their desire to "Go to it" if more collaboration of this type was introduced.

Executives Wanted

"WHAT we want most are executives. There is a great shortage of them," said the Ministry of Labour, when the 41's and 42's registered for national service.

Concentration of industry is releasing hundreds of men experienced in organisation and factory management. But many of them are 50 to 60 years old. They are told to wait until their classes are called to register.

Meantime, square pegs will be forced into the round holes of national industry. When, at last, the older men are called, the square pegs, still misfits, will be prized loose with difficulty, if at all.

Canteens or Short Commons?

DESPITE Mr. Bevin's appeals, industrial canteens are not being set up fast enough.

Even the smallest factories can have canteens. On page 30, one serving a works with only 250 employees is described. It runs at a profit, in spite of the low charges made for the meals served in it.

Thousands of workers leave home at seven in the morning and do not get back until nine at night, Sundays included. But they have to rely on what can be spared from the family rations.

Should not a Square Meal be included in the Square Deal programme?

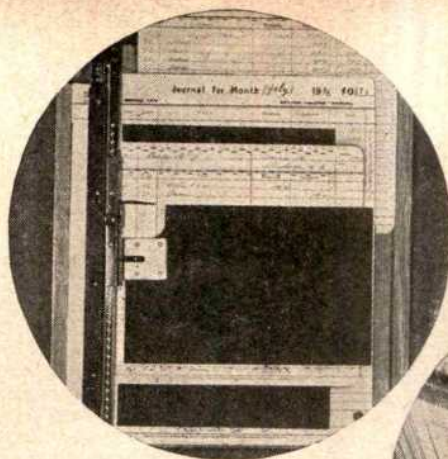
Wasted Labour

RATIONALISATION of industry must be hastened.

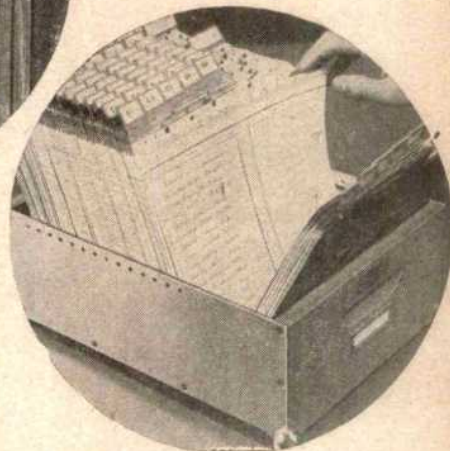
Every possible building is being switched over to a war-time job. Many small plants, rather than a few big ones is the aim. Dispersal helps transport, eases labour and workers' housing problems, hinders air attacks.

Arrangements for a vast new building programme are excellent. But there should be a better system of alternative premises for war work. In a firm making dial sights, 150 men were employed. When the premises were blitzed, the men were simply told to look for other jobs.

We must seek to avoid waste—waste of time, men and materials.



"CONTROLLED"
BOOK KEEPING



INTRODUCING Definac, our new Trade Mark, which now supersedes the well-known name Definitive, adding new features to its proved

Definac

LIMITED

advantages. Definac covers all kinds of records and accounts, performs several entries in one operation, and provides multiple records for safe keeping.

Whatever the problem, there is a solution with Definac.

DEFINAC ACCOUNTING

The adjustment of office routine to war-time exigencies has thrown the advantages of Definac methods into sharp relief. Wherever work is done on Cost Basis, the flexible simple, time-saving Definac system will be of particular interest.

DEFINAC VISIBLE

Speed of selection, instant re-filing, saving of space and secure signals are special points of Definac Visible. Entirely different, it can be used with any tray or binder and adapted to existing records. The Ideal Machine Posting Equipment.

DEFINAC LIMITED,

Sole Concessionaries of
DEFINITIVE ACCOUNTING LIMITED AND
S. & R. (DEFINITIVE GT. BRITAIN) LIMITED.

42, CHESSINGTON AV.,
LONDON, N. 3.

Phone: FIN. 5333.

BLINDS

J. AVERY & CO., 81, Great Portland Street, W.1.
& CURTAINS

Speciality—

A PATENT BLACK OUT BLIND FOR FACTORIES

No Light Leakage at Top, Bottom or Sides.
Proper Ventilation.

AVERYS

Est.
1834

DON'T TAKE THE RISK

of heavy loss through Boiler Explosion, Lift or Crane Accidents or Breakdown of Engines

The "GENERAL," with a staff of highly-qualified specialist engineers, will for a small annual fee provide Insurance, combined with the regular inspections and reports required by the Boiler Explosions Acts and the Factories Act 1937.

For information apply to:

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ACCIDENT FIRE AND LIFE
ASSURANCE CORPORATION
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General Bldgs., Aldwych, London, W.C.2

WAXCRAFT TYPEWRITER CARBONS

The NEW process
CARBON PAPER



- * Does not "tree" or crease.
- * Sharper impressions.
- * Costs no more.
- * Longer life.

FREE SAMPLES AND DETAILS FROM
STANDARD OFFICE SUPPLIES CO.,

57 FARRINGDON ROAD,
LONDON, E.C. 1.

Phone : CHAncery 5561 (4 lines).

Small Firms Can Have Canteens that are Economical

The Minister of Labour, Mr. Ernest Bevin, has appealed to ALL types of factory managements to equip canteens for their workers. For all works on Government orders, employing 250 workers or over, this is compulsory. Many small factories are hesitating on account of cost. This article proves that no factory is too small to have a canteen that can provide cheap, wholesome meals

NO firm need consider itself too small to have its own self-contained staff canteen. Works with only fifty employees can provide an efficient food service quite the equal of that of firms with ten or a hundred times that number of workers.

The great bugbear, as it is seen by the management of the average small firm, is that the cost of installation and operation will be heavy and the return totally inadequate. This is a needless and baseless fear, if advantage is taken of the advice of experts in industrial kitchen operation. Canteen management is as important and as specialised as any other type of management or welfare work, and there are plenty of experienced workers in this field whose knowledge is available to firms who are beginners in this field.

Inadequate Food Supplies Make Workers' Meals a Problem

A typical example of what can be achieved by a small firm exists in the heart of a factory area in North-West London. There, an engineering firm employs a total of some three hundred workers. Fully two-thirds of this number are able, by means of bicycles or public conveyances, to go to their homes in the dinner hour. But the remaining hundred are less lucky. The factory is remote from their homes and, to add to their food difficulties, the area in which the factory is located is very poorly served by restaurants, cafes and eating houses.

With the increasing difficulties in securing adequate foodstuffs to make sandwiches and the like, the position of these workers was brought to the attention of the management. The works manager was immediately instructed to prepare plans for an adequate canteen service.

Small Unused Rooms Can Be Converted Into a Canteen

On the advice of a canteen expert, three rooms in an unused part of the factory were commandeered. One of these, measuring roughly 25ft. x 35ft., was considered to be big enough for the main dining hall, while a smaller room, about 15ft. x 20ft., was arranged to serve as a dining room for the management and office staff. The third room, measuring only 12ft. x 15ft., was to be fitted out as the kitchen.

The actual operation of the canteen was placed in the hands of a firm of catering contractors. In the few months this canteen has been in operation, the caterers have been able, in spite of the low prices charged, to make a payment out of their profits sufficiently large enough to cover the works' share of the annual summer "bean-feast" and other welfare activities.

A typical menu consists of :

Entrees:

Roast Beef or Mutton and two vegetables 9d. per portion.
Fish (when available) and chips 9d. per portion.
Meat Patty or Pie and two vegetables 6½d. per portion.

Sweets:

Steam Pudding 2½d. per portion.
Apple Pie 2½d. per portion.
Milk Custard Pudding 2½d. per portion.
Pastries 1d. each. Tea or Coffee 1d. per cup.

It will readily be seen that if, as is the case, liberal portions are sold at these prices—the workers have little grounds to complain about on account of cost.

The canteen service is not confined to dinners. Breakfast is served to the night staff, fire-watchers and the Home Guard sentries. There are two breaks of 15 minutes each in the working hours, at 10 a.m. and 3 p.m., when tea and coffee is served. There is also a tea break at 5 p.m.

In addition, the night shift can obtain meals during their shift, as required. When an employee is likely to work late and requires sandwiches or similar food, these can be obtained from the canteen on demand.

More Than 150 Dinners Can Be Served In Five Minutes

So popular has this canteen proved and so efficient is the service in spite of what might well be considered to be very cramped space, that some sixty employees from a small neighbouring factory come in every day for their mid-day meal. Thus, dinners for over 150, plus numerous other meals and many hundreds of cups of tea and coffee are served each day. To handle this trade the total staff consists of a manageress and three assistants, who normally work a 10½ hour day.

Speedy service is naturally essential and even at dinner time all the customers can be served within four or five minutes at the cafeteria counter.

VENUS PENCILS

VENUS PENCILS are incomparably smooth and long lasting, their standard of quality never varies.

MADE IN ENGLAND
KNOWN THROUGHOUT THE WORLD.

If you have any difficulty in being supplied, write direct to the address below for sample, stating which degree you prefer.

VENUS PENCIL Co. Ltd., LONDON, E.5.

From 6b
softest to
9h, hardest

Six Short Cuts to OFFICE EFFICIENCY AND ECONOMY

HOW TO MAKE SURE THE ENVELOPE IS EMPTY

NOW that most business houses are practising stationery economy by using envelopes two or three times, former methods of slitting envelopes to ensure all the contents are removed must not be used.

A large mail-order house has devised a system of inspecting salvaged envelopes which is even speedier than the old slitting method. A section of a wooden counter was cut out and a piece of ground glass substituted. A strong light was then placed under the ground glass and now all a girl has to do is to pass the envelopes quickly across the glass and into the basket for re-use.

GIVE NEW EMPLOYEES A GUIDE-CARD

WHEN taking on new staff avoid wasting the time of new and old employees by giving the new member a card or sheet on which his duties are set forth, together with other information such as:—

Office methods he will have to follow;

Where equipment and data he will need can be found;

Names and positions of key people he will have to refer to.

Other information can be included according to the position of the new employee and the nature of his work.

COLOURED CARBONS HELP SORTING

NOW that tinted duplicate copy paper is frequently unobtainable at any price, many firms are having difficulty in filing or dispatching copies of letters, memos etc. to their right destinations. This difficulty can be overcome by the use of carbon sheets of various colours, the colours of the carbons matching as closely as possible the tinted paper previously used for duplicates. A further advantage of this idea is that it permits old letter-heads and other waste stationery to be used for duplicate copies, an economy that many firms are now practising.

DIRTY OFFICES MEAN TIME LOST

OFFICE employees don't like dirty hands, and if the offices, desks, books and papers are dusty, the users will spend a good deal of the firms' time washing their hands.

It pays to have the offices well cleaned and dusted. If the premises are large, one cleaner should be put in

charge and made responsible for the condition of the offices.

In addition, it does not cost much to provide each member of the staff (or at least the feminine members) with a duster—which will be used and appreciated.

Dirty windows are also a cause of waste time, or, rather, impaired efficiency. Employees work better if they can see well by daylight. The same applies to electric light fittings; see that they are clean and let through the maximum of light.

HOW TO ENSURE MAILING LIST ACCURACY

MISPELLED names and wrong addresses exact a terrific annual toll in returned mail, in new address plates and stencils and in wasted stationery, envelopes and postage, to say nothing of lost orders and antagonised customers.

One firm places such a premium on accuracy that it requires its entire sales staff to take a special course in hand-lettering, so that there can be no possibility of misreading the names and addresses of their orders and prospect lists. In addition, a copy of the address plate is sent to the salesman for verification as soon as an order is received.

MERCHANTS GIVE "SAVE PAPER" TIPS

PREPARING for the worst, following the Paper Controller's recent warning that paper will be shorter than ever during the sixth licensing period which has just begun, a well-known firm of paper merchants, have written to their business connections explaining the position and giving hints for economy.

They point out that the Controller has told merchants that it will be necessary for them to ration their customers more severely.

The following hints for saving paper are listed:—

1. Use the smallest sheet of paper for any purpose that will do the job.
2. Type on both sides of the sheet.
3. Do not keep copies except where absolutely necessary.
4. Consider whether all the number of copies taken in system forms are necessary.
5. Always type single spacing.
6. In all cases (letters, commercial printing jobs and pamphlets) curtail margins.
7. Consider using smallest type face consistent with legibility.
8. Try not to pack articles individually—pack in bulk.

First Printing - - SOLD OUT
Second Printing - NOW READY

The Loose-Leaf Encyclopædia of WAR DAMAGE & COMPENSATION

Edited by **JOHN BURKE**,
Barrister-at-Law.

This work is essential to every Business House. It contains the War Damage Act, 1941, and every other Statute, Rule and Order relating to war damage and compensation, fully annotated and indexed.

The advantage of having the whole of this important matter under one cover and a single index will readily be understood. It is an even greater advantage that it is in loose-leaf form and can be kept properly up to date.

Price 20/- net, postage 1/-.

Always up to date by the issue of Supplemental Loose-Leaf Parts: price 5/- each, postage extra.

WAR LEGISLATION

The accumulation of 21 months of war-time Acts of Parliament, Rules and Orders has resulted in a huge and intricate mass of material which it is impossible for the ordinary man to cope with although it affects him vitally in a hundred ways.

The solution of the problem is to subscribe to:

BURKE'S LOOSE-LEAF WAR LEGISLATION

where it is all collated, indexed and kept up to date.

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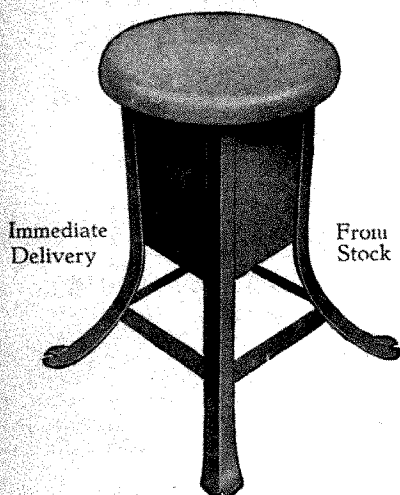
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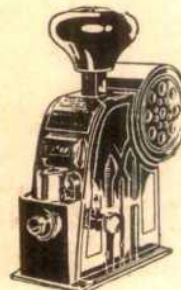


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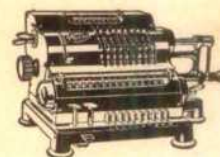
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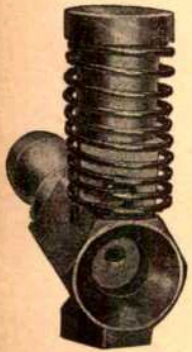
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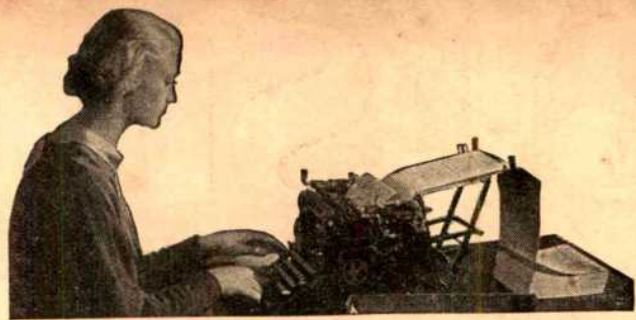


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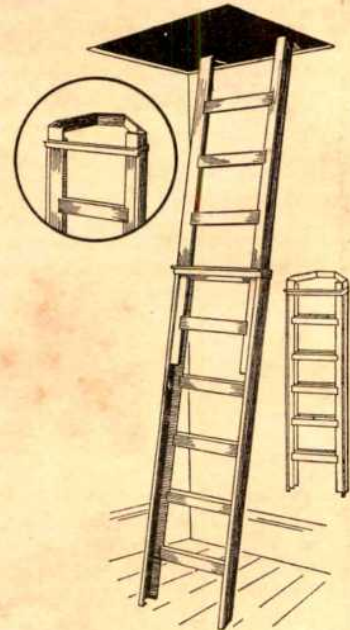
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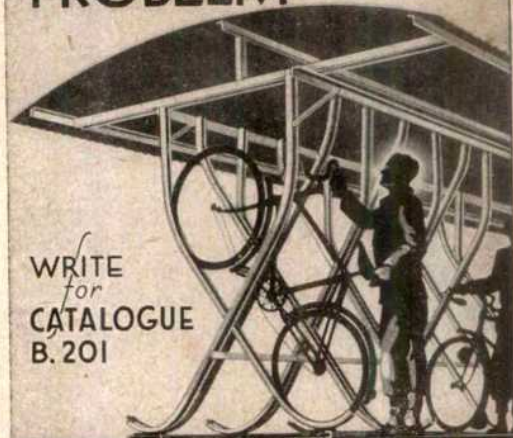
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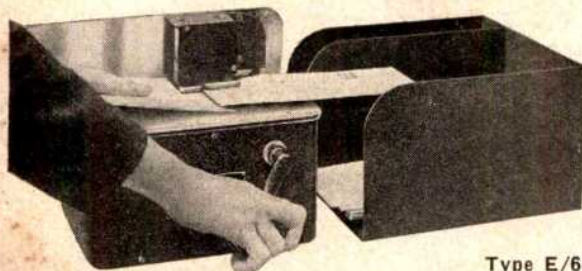
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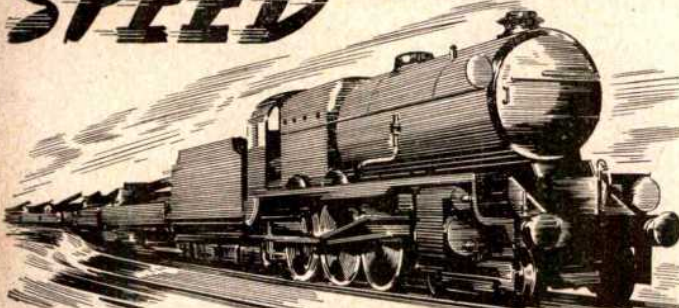
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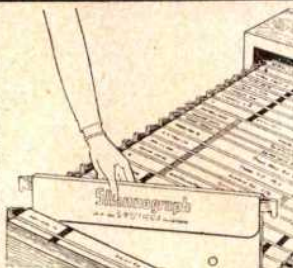
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To Executives

Gentlemen,
*You do not tolerate inefficiency
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NOISE

*the basic cause of inefficiency
in Office and Workshop.*

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"EFFECTIVE CONTROL" MEANS THAT—

Labour, Materials and Machines are utilised to the fullest possible advantage, that operation follows operation with regularity and precision, that waste in time and material is a known factor constantly under review. It means economic purchasing, controlled stock, balanced production, scheduled progress, planned maintenance, speedy, accurate costing.

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THE COPELAND CHATTERSON CO LTD Exchange House Old Change London EC2



TRAINING SCHEMES MUST BE DEVELOPED TO THE MAXIMUM EXTENT

"Take in more new workers for training on the job in your own works. Remember that the Government will help you with semi-skilled men and women trained under official schemes."

(This is Point No. 2 of the Ministry of Labour's "4-POINT PLAN TO INCREASE WAR PRODUCTION" addressed to management.)

THE OTHER 3 POINTS IN THE PLAN ARE:—

POINT No. 1. Skilled men are needed for the really skilled jobs. Be sure that each of your men is employed up to the very limit of his skill. Combat skilled labour shortage by breaking down processes wherever you can, and by training up your workpeople, both men and women, to jobs of greater skill.

POINT No. 3. Prepare, now, to employ more and more women. Look constantly to women for your new recruits; they are excellently suited to many types of semi-skilled work. Hundreds of thousands must enter war production this year and every factory must play its part.

POINT No. 4. Efficient personnel management is essential. Remember that you must secure the whole-hearted co-operation of your workpeople. Look closely to their welfare. Many of them may be new to industry; be patient and help them all you can during the first difficult weeks. A little foresight will reduce your labour turnover.

ADVICE GLADLY GIVEN ON THE DEVELOPMENT OF A TRAINING SCHEME IN YOUR WORKS.

If you feel you would like advice on the development of training in your works, remember that the Labour Supply Inspectors of the Ministry of Labour and National Service are ready and anxious to assist you. You can reach them through the Manager of your Local Employment Exchange. You can obtain full particulars of the Government Training Schemes from the Inspectors or from the Exchange.

REMEMBER! if you have not yet received your copy of "THE EMPLOYMENT OF WOMEN . . . SUGGESTIONS TO EMPLOYERS" instruct your secretary to write for one to-day, asking for pamphlet 87/1941 to the Manager of the nearest office of the Ministry of Labour and National Service.

MO. ILISE FO.



Plans to Help You in Your Most Urgent Task—to Counter the FALL IN OUTPUT

Maintenance of Workers' Enthusiasm at Top Pitch is the Key to Maximum Production

By CECIL CHISHOLM

LET us face up to the facts. Output has fallen seriously at the very moment when tanks, guns, planes are most urgently needed.

True, Lord Beaverbrook is on the job. As Minister of Supply, he will cut miles of red tape, expedite supplies, deal drastically with bottlenecks.

But don't let us leave it to Lord Beaverbrook. Every business in this country needs a Beaverbrook to-day. Why not be the "Beaver" of your own concern?

Management is as much to blame as the workers for what is happening. The urgent need is to realise the full scope of the problem, so that the causes of the trouble may be dealt with one by one.

Now two of the chief causes of the trouble are too often brushed aside by directors. Both men and women are tired after twelve months of exceptional strain and overtime. A week's holiday will do more than anything else to remedy this.

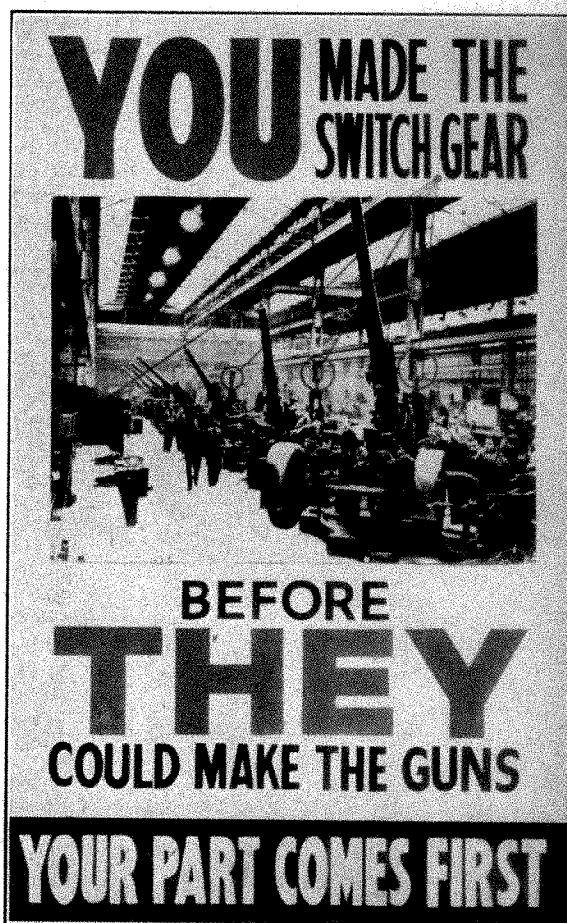
But there is a second, more far-reaching trouble. During the last war there were incentives galore. Dick Jones could re-furnish his house from floor to ceiling. He could buy himself a motor bike and his family a gramophone for the winter evenings. He could afford to buy the missus not only more frocks, hats and shoes, but

a fur coat if her fancy turned that way. He could give the family the time of their lives at Blackpool or Margate. The shop windows were lighted and the shops were open until seven or eight at night. It was worth while to go all out.

What Can The Worker Do With His Wages?

But what can he get with his extra money to-day? Clothing is rationed, radios are scarce. Food is rationed, even cigarettes and beer are hard to come by; many beaches are wired off. Of every extra pound he earns, seven or eight shillings go in income tax. In fact, the great stimulant to hard work — enjoyable spending — has been removed.

Posters like this help to bring home to workers the national importance of their individual jobs.



Methods that Counter the Basic Troubles Lying Behind THE FALL IN OUTPUT

- Analyse the Causes of Slackness.
- Give the Worker more Facts.
- Use Better Records of Absenteeism.
- Re-adjust Wage Payment Schemes to New Worker's Capacity.
- Cut out Absenteeism among Executives.
- Give Extra Personal Services—e.g. Barber's Shop at Works, Sick Visitor, etc.
- Use Available Legal Checks on Absenteeism—better are urgently needed.

Usually the hard worker is also the hard spender, and as the gusto has gone out of spending, the gusto has likewise gone out of working. These are the human facts that the Select Committee on National Expenditure and so many of our civil servants completely overlook.

There is another factor over which there tends to be a conspiracy of silence. It strikes me every time I step off the train into one of the industrial towns in the West Midlands or the West. Many of our great industrial towns and cities have had almost no experience of serious air raids. There have been a few stray bombs, perhaps one factory hit and some workmen's homes demolished—that is all. Some of the largest works I visit are even in towns which have never been hit by a single bomb.

Employers Must Be Their Own Propaganda Ministers

What is the result of this? The fact is that neither the managements nor the work people in these places, with a few exceptions, are urgently war-minded. Why should they be? They have seen no burning homes, no dying people, to bring the urgency of the situation home to them. So unimaginative is our race that for many good easy folk in management offices and at factory benches, the war is something still far away. Business is good; wages are high; work is steady; why overdo it? Can you blame them?

For this, of course, our incredibly incompetent home propaganda section of the Ministry of Information must bear most responsibility: but a big weight rests with the employers. Many employers have made no serious effort whatever to bring home to their workers in non-blitzed areas the

urgency of straining every nerve to maintain output against the autumn's dangers.

In the scores of factories I have visited I have seen only three which have even run special posters explaining to the workers the importance of their job. The best of these are issued by a concern making electrical equipment. They are so good that we are reproducing three. The managing director of the company tells me that they have been extremely successful.

"Our stuff doesn't go up with a bang," he explained. "It does not look very lethal. The high-spirited and conscientious worker says to himself 'Isn't there something more vital I can be doing. Couldn't I be building Spitfires?'"

"The answer is that equipment of our type is essential to factories making aircraft, heavy guns and many other forms of munitions.

"We designed this series of posters to bring that fact home. They didn't cost very much to produce. In one or two cases we bought a photograph for reproduction on the poster and the local sign writer did the lettering.

"As you will appreciate, nothing is more irritating than seeing the same poster on the factory wall eternally. So we try to change the posters once every two or three weeks."

Executives Must Set An Example To Lower Ranks

Here is an inexpensive idea that any and every factory on obviously urgent war work can adopt. Its application is much wider, its appeal more personal than that of the Government "War News" series of posters.

A second method that successfully combats apathy is the insistence on no absenteeism among executives. Says

These Five Causes were adjudged in the June issue of BUSINESS, to be The Basis Of

ABSENTEEISM.

Remedies tested over periods of months, are listed after each.

1. ILL HEALTH.

**Distribution of malt, oil, anti-cold and 'flu prophylactics.
Canteen hot meals at low cost.**

2. FATIGUE.

**Comfortable transport facilities.
Maximum 54-hour week.
Time off for shopping.**

3. VISIT OF HUSBAND OR FRIEND.

Time off for women.

4. BIG MONEY ON SUNDAY WORK.

**Absentees cut out of all overtime.
Absentees refused Sunday work**

5. LACK OF INTEREST.

**Ruling forbids worker to be absent from any part of normal shift.
Creation of feeling of security.
Complete insurance schemes.**

the employment manager of the Ford Motor Co.:—"We are convinced that the excellent spirit of our employees is due, not only to their good working conditions and the rates of pay, but to the fact that all employees from the directors downwards are always on the job. Directors, managers, heads of departments and all the higher officials spend their working time at the factory, much of it on the floor. There being no absenteeism in the higher ranks, the whole organisation is imbued with the same spirit."

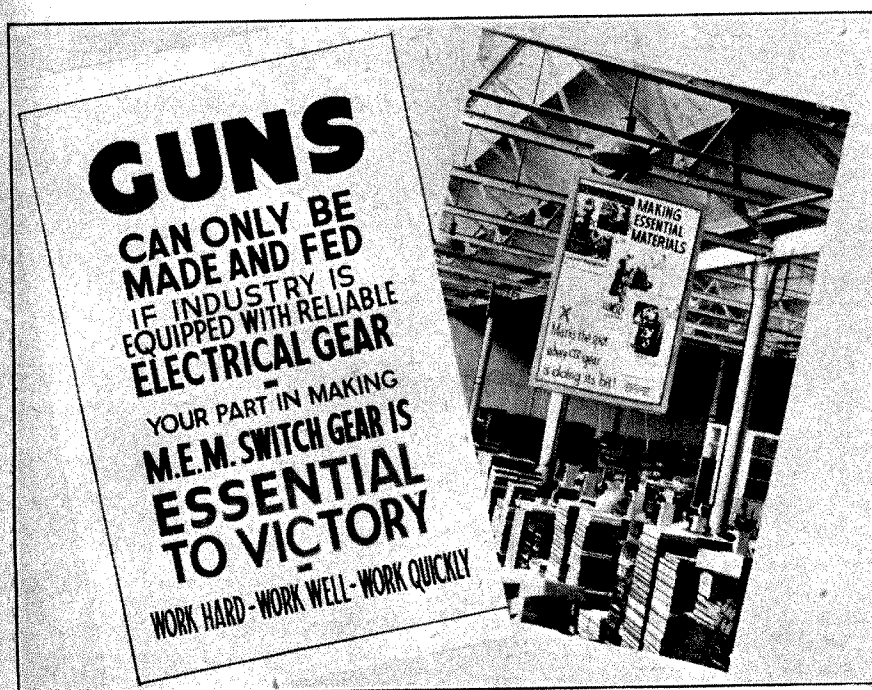
I find this tendency very usual in the firms which are securing the best results.

Half a dozen expert managers emphasise the importance of having better records of absenteeism. At the present moment one is using an extremely simple device to analyse this situation. On absence from work, the worker's card is automatically removed from the rack. The man or woman concerned can only secure it by seeing the personnel manager who returns it after making a record of the reason for absence.

Let Workers Know the Management Is Interested In Them

Ford took the matter in hand many years before the war. Wherever there was chronic bad time-keeping investigations were made to find out the cause and to remedy it.

There have been very few cases indeed of serious absenteeism even during the worst days of the blitz. When transport was disorganised and it was difficult to get to work on time, many of the employees telephoned to say what their difficulties were. Invariably there would be the added



Two more of the special posters which tell electrical workers of the vital need for the gear they help to produce

Twelve More Firms Tell How They Ease ABSENTEEISM

remark that "I shall report for work as soon as it is possible."

Another motor concern keeps a list of all absentees normally, so that the employees are aware that the management is interested in their absences. The personnel manager believes that this tends to keep absentee figures low.

It is a fact that many work people appreciate a firm's interest in their absences. One of the prime causes of absenteeism is the worker's conviction that to the management he is only a number representing a certain amount of output and profit.

Incidentally, methods of helping the worker to keep fit are improving every day. One motor concern is offering sun-ray treatment to certain workers. Another electrical equipment concern was supplying halibut liver oil capsules during last winter to reduce illness.

Long Hours May Mean Fall In Output

What is the precise effect of overtime and of the long shift on health? Some interesting work is being done to co-relate this. The directors of one concern up in the North showed me some figures recently, which seemed to indicate that consistent overtime resulted in increased ill-health between two and three months later.

The hours question is, of course, more complicated than it looks. The firms which have most trouble with long hours and overtime are those which worked the shortest week before the war.

Where the working week was 40/43 hours, a five-day week was generally worked. People got used to having Saturday off. Therefore, the introduction of even a 47-hour shift with work on Saturday was immediately regarded as overtime. Further, the temptation to stay away was the greater since the whole household had got accustomed to the man being at home on Saturday. But to the worker who was working 47/48 hours a week, the increase to 54 hours a week was often felt much less of a hardship.

Volume Of Absenteeism Varies With Industry

A great number of people have asked me what is the average absenteeism to-day. In fact there is no average. In the aircraft factories absenteeism is running anything from 10 to 20 per cent. In the big civil concerns turned over to war work, already possessed of a loyal and trained body of workers, it is running round 7/8 per cent. In smaller concerns on war work it may

Haircutting in the firm's time is a popular solution discovered by one firm. A complete hairdresser's shop has been installed at the company's expense.



be as low as 5/6 per cent. In the majority of small concerns whether on war work or not, absenteeism is still virtually nothing. The personal touch entirely prevents absenteeism.

Four Good Ways To Keep Workers Happy

Mr. Lewis East writes me that in his own small concern absenteeism is non-existent for the following four reasons:—

(1) We have no square pegs in round holes.

(2) Every worker is given some measure of responsibility, however small. This gives them confidence and a feeling that they are a *vital part*, not just a cog.

(3) We have fought 'short time' equally with 'overtime.' However, bad trade has been temporarily we have made stock rather than run 'short.' The workers know this and it has given them confidence that management is studying them to insure a full pay envelope 52 weeks in the year. (We gave holidays with pay before larger firms ever thought of it).

(4) Make a pal of the worker. If Dick's dog has *distemper* ask, "How's the pup?" If Maggie's Ma only has the *temper* show a little interest.

Women Are More Frequently Absent Than Men

Most of my readers will envy the lucky and human Mr. East.

In response to enquiries, the following facts may at least be helpful. They are taken from a close analysis on absenteeism made by a brilliantly directed concern employing around 1,000 people in the West Midlands.

Pre-war absences (all causes) 1.3 hours out of a 43 hour week=3.02 per cent.
Wartime absences (all causes) 4.1 hours out of a 54 hour week=7.45 per cent.

CAUSES OF ABSENCE.

MEN

Certified illness 16.9 hours per 1,000 hours.
Casual illness 5.2 " " " "
Other reasons 6.3 " " " "

WOMEN

Certified illness 36.7 hours per 1,000 hours.
Casual illness 10.8 " " " "
Other reasons 19.8 " " " "

The significant figures here are the doubling of absences among women as compared with men and the trebling of absences for "other reasons."

Managements Can Render Personal Services

Since writing last month, one or two concerns have told me of interesting methods of securing shopping time for women workers. The Ford Company have arranged for women employees to start work on Saturday at 6 a.m. and to finish at 2.30.

Thos. Staniforth & Company of Sheffield allow both men and women to finish on Friday night at 4.30 instead of 5.20. Mr. G. T. Carter says that the early night once a week is enormously appreciated by his people.

Finally, at least a dozen concerns up and down the country have stressed to me the importance of little extra personal services. Many of their experienced directors are convinced that it is the lack of personal touch that is at the root of much of the trouble.

Another concern has taken the bull by the horns on one aspect of shopping troubles. They have converted a room into a completely equipped hairdressing saloon in charge of a first-rate West End hairdresser. Originally intended to save the time of the men, the service has been extended to the trimming of women's hair as well. Prices are the same as those charged in suburban areas, and tips are permitted.

Bookings for appointments are left at a nearby entrance of the factory so that anybody can have their hair attended to in ten or fifteen minutes instead of enduring a tiring hour's wait in the barber's on Saturday afternoon.

We Link Wages with EFFORT rather than OUTPUT

ALTHOUGH not a new war factory, we have the labour problem in an extreme form. In fact we are now taking on 150 new workers every week. The majority of these men and women have never been in a rubber factory in their lives before. Some of them have never been in any factory before. So we have most of the problems of the war factory.

With this difference, that ours is an industry which has been steadily growing and is unused to quick expansion or contraction of personnel. Of our 7,000 employees, about 600 have been with us for 25 years. In addition, over 2,000 of our people have been working at Fort Dunlop for more than 15 years. These employees, distinguished by wearing gold and silver badges, have a steadiness and loyalty which provides normally the finest backing against slacking and absenteeism-tradition.

Traditions Mean Little to a New Employee

That tradition has been carefully built up over a half a century. Our workers have had their pensions scheme, their canteens, their allotments, their sports ground for decades. To-day, we have a great deal of music in the works and at least two ENSA concerts every week.

But what do all these complete personnel services mean to the newcomer? Very little, I am afraid. The girl coming to us say from a Lancashire cotton mill has not seen these services built up carefully and painfully over a life-time. She has had no hand in the organising or the frank criticism of any of them. They are just there, like the works chimneys, part of the landscape.

Strangeness of Environment Makes Interest Difficult

In a certain sense, therefore, they have not been earned, and what we don't earn we don't appreciate. Further, many of those workers who have left home for the first time feel themselves "out of it" and amongst strangers. Faces and speech are new to them as well as processes. All of which makes the creation of personal interest in the job or works exceptionally difficult.

Even in peace time, with no transport delays, food shortages or accommodation discomforts, it takes a couple of years to train a stranger into a conscientious and loyal member of the working force. Now we are trying to do it in a few months.

Further, in dealing with such large numbers of people, it is impossible to

In dealing with 150 new workers a week

**By A. HEALEY, B.Sc.,
Works Director, Fort Dunlop**

use the careful methods of training which are normal here. We are compelled to rely on foremen, charge hands and experienced workers to teach the newcomer the elements of his or her job as rapidly as possible. Fortunately, the fact that a good deal of our work is of a processing nature in which groups of workers co-operate makes this easier.

Under these conditions, I find that three main methods of interesting the worker quickly and effectively are these:

- (a) We try to keep exceptionally close contact with the people at the works.
- (b) We attempt to link payment with *effort*, not simply with *output*.
- (c) We tell the workpeople as much as possible about the work they are doing.

There is a tendency in this country to regard the most important of

HERE IS A SECOND METHOD . . .

The preliminary formalities to employment should be informalities.

Show every new employee the whole of the works, welfare sections, etc., before assigning him or her to a job.

Managements must realise that employees want work and reward, light, fresh air, fair play, a friendly atmosphere, encouragement, security and most of all, inspiration.

During training period beginners should receive about 75% of what they can eventually earn at piece-work rates.

These are the main features in the programme adopted many years ago by one of the largest manufacturing firms in the Midlands, and their worth is shown by the remarkably low rate of absenteeism in this group of factories.

personnel decisions as simply a "labour matter." To put a notice up on the bulletin board about hours or conditions is not enough. The management must watch, test, control the results of each decision and must attempt to understand the average worker's reaction to it. That cannot be done in the manager's office. Output can only be pushed up from the factory floor.

Executives on Night Shift Make for Good Relations

For that reason each chief executive always spends a night a week in the factory. That is to say, he is about the shops until around midnight, and after a brief rest finishes the morning with the night shift. There is no other way of understanding either the technical or human problems arising from night work.

In this way one is able to get a more personal relation with the night staffs and the night foremen. British workers have a particular aversion to the white collar man who dodges his night work to-day, be he a mate, a foreman or works manager. Only second to personal knowledge of the position at night I should place methods of wage computation. There is a great deal of room for a more delicate adjustment between the wage packet and the work it pays for. In particular, the premium bonus systems, like piece work, have over-stressed the importance of the number of pieces finished, have under-stressed the amount of effort needed to finish them.

Limited Output Often Results From Premium Bonus

What is the result? A premium bonus scheme often actually limits output at a point favourable to the worker. Under piece work the temptation is to take a day off in very hot weather on one excuse or another, or when one is feeling a little off colour, and try to make up the losses on other days. On the other hand, when the worker has had his day off, he probably gets more work done than he would under simple time rates.

Personally, I am in favour of the present trend back to straight piece rates and away from the premium bonus system. However, a number of

the workers have become so accustomed to the premium bonus system since the last war that they do not take kindly to a straight piece work rate.

Our experience here is that the standard Rowan system can be so adapted as to give most of the benefits of a straight piece rate. The difficulty with the Rowan system, as everybody knows, lies in the worker's temptation to ease off immediately he has reached a certain level of bonus. He believes that the extra effort required to get a higher bonus is not worth the extra money it brings. This is the fatal weakness of the Rowan scheme.

A Solution To The Shortcomings Of The Rowan System

The obvious answer is to increase the bonus after this point. This we have done here with excellent results. Indeed, we have removed the stopper on weekly output in this way.

As some of my readers might be interested in the method, I give it in some detail.

As usual under the Rowan bonus system, the estimated time per piece that should be taken by an average worker, is first determined by time

... AND A THIRD

Pre-war this Northern concern used the Rowan bonus system. Bonus was paid at a point 20% below the standard time. For new unskilled workers bonus now operates at approximately 50% below standard time. The rate of bonus has, of course, been adjusted accordingly: it now rises gradually until the full bonus is reached at a point 20% below the standard time.

study. For realising this time, the worker earns an agreed percentage above the day-work hourly rate.

The total time paid for at the operative's daywork rate is thus:

$$\frac{\text{Time taken} \times \text{Time saved}}{\text{Time allowed}} + \text{Time Taken}$$

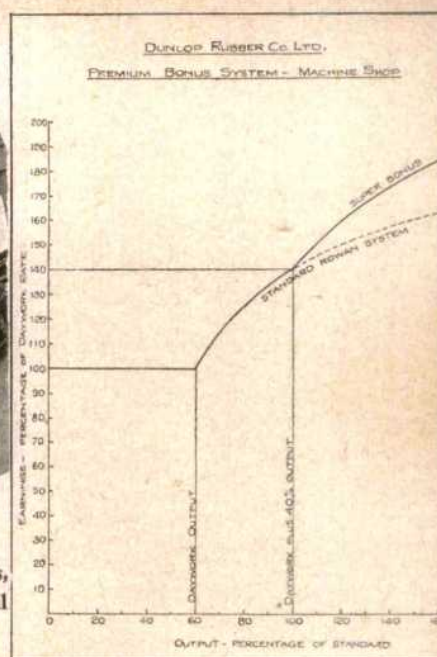
Using the above formula, it will be found that the allowed time to yield 40% over-day-work for realising the standard time study time, is $1\frac{1}{3}$ times the standard time. For example, a job estimated to take 60 minutes would be allowed 100 minutes. If the time taken on the job is 70 minutes, the total paid time at daywork rate is

$$\frac{70 \times 30}{100} + 70 = 91 \text{ min. (equal to 30% over D.W.).}$$

To encourage operatives to maintain a high effort and secure maximum machine efficiency, bonus earnings in excess of 40% over day-work rate are doubled by the company, each job contract being separately assessed for P.B. earnings.



This chart shows how the super bonus, not provided for in the Rowan system, will lead to increased output



This addition is calculated in the following way:

If the bonus earned exceeds 40% of the actual time taken on a job, the excess time of 40% is again credited to the operative.

In the example above, if the time taken had been 50 minutes, the total paid time would be:

$$\frac{50 \times 50}{100} + 50 = 75 \text{ min. (equal to 50% over D.W.).}$$

Bonus time = 25 minutes.
40% of time taken = 20 minutes.
Bonus time excess over 40% = 5 minutes.
Total paid time = 80 minutes (equal to 60% over D.W.).

The attached chart shows the relation between output—percentage of standard and operative's earnings.

This change in the Rowan system has given us good results and I shall be interested to hear of any similar experiments in other factories.

Is 47/48 Hours The Ideal Working Week?

No wage system is exempt from the effect of long hours. Probably, the ideal working week is one of 47-48 hours. To-day, half the concerns in the country must be working 54-60 hours per week. Whatever the wage payment system, long hours may double the number of errors made by clerks on every invoice. We have had this experience ourselves.

Our feeling here is that the 60-hour week can be worked without any serious effect on health or output for about a year. After that, it is doubtful whether a shorter working week would not give better output.

In the case of processes where the machine determines the rate of output (of which we have a number), long shifts are inevitable because of the shortage of labour.

The 60-hour week is apt to increase the accident rate and to cause more faults and ill-health than it is worth. When it is possible we attempt to slightly reduce our working hours.

In the departments where Sunday work is done, we attempt to get variety by giving the workers $6\frac{1}{2}$ days on a day shift (including a Sunday) and 5 days on the night shift making $11\frac{1}{2}$ days in the fortnight.

So far I have been dealing with the difficulty of making efficient and loyal workers out of strangers. But there is another side of the picture here. Our old workers are magnificent.

A long time ago we had quite a blitz at one of our works in the country. Yet the canteen workers on the night shift insisted on working through it to get a hot meal ready for their colleagues. Even though the imminent danger signal has been given, the girls always try to have a meal ready for the night shift at all our works. My admiration for these girls' pluck and tenacity is unbounded.

It is our job to attempt to diffuse their spirit among the newcomers to whom everything is so strange and difficult.

Tonic Talks Help To Keep Up Employees' Enthusiasm

There is one new method available for doing this. This is a loud speaker in the works. I think we have been very slow in this country in realising how much the workers appreciate an occasional straight talk from a director. We have found a short explanatory talk from an executive very successful in interesting the new people in their jobs.

It makes a difference to some of them, for instance, to know that the tyre they are making is going on a Spitfire. And is not that natural enough?

The pity is that management has been so slow in developing a technique for giving the workers more than merely music from the loud speaker. It will convey reason as well as rhythm.



MANAGEMENT *in* *War-time . . .*

What to do with a Semi-Occupied Sales Force

THERE is one problem of war time business that is puzzling many firms to find a satisfactory solution. This is, what to do with a sales force which, at best, is only semi-occupied.

Many of the food, luxury and clothing concerns are keeping big forces of salesmen going but are able to offer them little more than a few hours' work a week.

The average salesman is temperamentally keyed up to work at high pressure and long periods of enforced laziness may well cause him to go stale.

One concern has found what they consider to be an ideal solution. They are constantly in need of more workers for their various factories, so they detail any salesman with time on his hands to the task of finding these needed workers. This scheme is working out very satisfactorily in practice, as might well be expected. The firm concerned argues that if its own salesmen can't sell the firm to prospective workpeople, who can?

SALESMEN INTO "CHASERS"

Another solution is an adaptation of the scheme outlined in the June issue of *BUSINESS*. With supplies of raw materials constantly being held up, with resultant delays in the factory requiring them, "chasers" can satisfactorily be employed to keep contact with all suppliers.

Here again, a salesman is the ideal man for the job. His natural persuasive bend will prove of immense value in contacting suppliers and stirring them into increased activity. The average salesman is an intelligent type of individual, capable and accustomed to working on his own. There is one case

on record where the salesman-chaser, finding that his factory's original source of supply had been bombed, contacted and completed arrangements for the needed materials with another firm, before his own company was aware that the original supplier has been blitzed.

Some firms are taking the opportunity for the complete reorganisation of their sales and accounts departments. Even in pre-war days it was recognised that there was a certain overlapping between the functions of the two sections. At the same time, the lack of personal contact between the customer and the finance department often resulted in slight friction which might easily have been avoided.

SALES AND CASH COMBINE

The war has presented them with the chance to put the responsibility for credits and collections on the sales department. A general shortage of office staff, coupled with the many extra duties imposed upon it by the war, has often meant an even greater gap between the sales and accounts departments than existed before.

A reorganisation of this type really means that a financial department is created within the sales department. The sales department takes over all responsibility for credit records—a most important point these days, when so many small traders are, by reason of the falling-off of their trade forced into the bankruptcy courts or compelled to compound with their creditors.

The co-ordination of selling and accounting makes for a substantial reduction in the credit risks. The salesman in the field has his opposite

number in the office and the personal contact between the two makes for a much more efficient system than was ever possible before. It leads to reduced costs of credit checking and collections.

The improved efficiency of the sales-cum-accounts department avoids the appalling friction, misunderstanding and endless trouble which happens in so many cases when the salesman has no further interest in his customer once he has taken the order, and the accounts department has no interest in the customer being kept sweet.

With separate departments, the accounts section is likely to appear to salesmen and customers alike as being staffed with a lot of cold-blooded, figure-minded people whose most pleasant epistles are little better than dunning letters.

TIME FOR THINKING

The show-rooms and offices of a leading time-recording manufacturing company contain neatly framed little pictures bearing one word: "THINK". The sales manager explained to me that it had practically become the slogan of his department.

All too often he had found his sales staff were acting without thinking. "It isn't that they were deliberately negligent," he explained, "but they were acting impulsively, and therefore wrongly. Now, with that one little word before them, they are encouraged to take a few minutes off to do a little constructive thinking." It helps them and sales are rising accordingly.

THAT AUGUST TRADITION

Around every industry traditions spring up. You can't get orders on Saturday morning . . . no use to call before 10 in the morning . . . August is a dull month . . . better stop work two days before Christmas because nobody's going to buy then . . . and so on . . . and so on.

One sales manager told his salesmen that he wanted them to keep on calling last August, irrespective of the day, the time or holidays, to test the validity of that tradition. They did. One made his normal non-holiday month number of calls in August Bank Holiday week and got:—

One order on Monday (the Bank Holiday);

Four orders on Tuesday (they're not back yet);

Three orders each on Wednesday, Thursday and Friday, and

One order on Saturday (the day they're not in).

This was well above the record for the best weeks of the year. He called without competition. Other salesmen were all out observing the tradition.

Pre-Training Women To Meet Your Factory Conditions

This is as necessary as Technical Training for Workers new to Factory Life

By NOEL FRAMPTON

(Based on a Special Investigation for BUSINESS)

IN the wide range of war-time industry which, for the purpose of very general classification, we may call "engineering," the difficult problem still confronting factory management is that of how best to train the new women workers.

These women can be classified into three main divisions:

1. Women of the typical "factory type": e.g. those already well experienced in production industry and who, on entering war factories, are merely exchanging one factory job for another.
2. Women from business and professional jobs in offices, shops, schools, universities, etc.
3. Women of no previous business or industrial experience at all.

With women in division number one not a great deal of difficulty is experienced. The typical factory type women are (for the most part at any rate) experienced in some sort of production work, especially repetitive jobs, so that training is only the comparatively simple matter of teaching them a limited number of fresh operations.

War-time Workers Present Special Training Problems

Women in the other two classes, however, present a quite different problem.

Speaking very broadly, and entirely without personal reflection, it can be said that most of the women in both these divisions are of a higher intellectual and educational standard. It is this type that is well suited to the vast number of new jobs for which women are urgently required to take the place of men in the modern industries of this war.

It is to train these women for these jobs that factory managements are finding so much difficulty.

Of the government training centres that exist I have heard much criticism from the executives with whom I discussed the matter. The main complaint seemed to be that the official training schemes are "based on a last-

war (1914-18) standard and are too narrow in scope to supply the much wider and more complex needs of war-time industry to-day."

It would be beside the point to discuss here the detail of these criticisms. The situation is, however, individual firms must themselves give the necessary training to the recruits.

Conditions and jobs vary, firm by firm, but, as was shown in the May issue of BUSINESS, the range of work open to women is very wide indeed.

Women Must Be Prepared For Factory Life

But over and above this there is the basic matter of introducing to these women the very elements of factory life. These elements include such things as the nature of, and reasons for, factory discipline, methods of wage and bonus payments, incentive systems, importance of safety measures, and so on.

True, in the government training centres recruits do get some inkling of factory conditions, but, it is criticised, too often they get it in the wrong way. They meet it quite incidentally as a kind of shock, and its incidence is responsible for a great many potentially efficient women dropping out.

Training of the women recruits (both in factory life and in work technique) is, broadly speaking, carried out in individual firms by means of one of two methods: (1) by a specially organised training school or department; (2) by carrying out training "on the job" in the actual factory.

Among the dozen well-known manufacturing concerns that I visited in connection with this enquiry opinion as to the efficacy of these two methods was divided. For the first it was claimed that (a) the more intensive training made possible by a school relieved the factory of the "drag" effect of a lot of learners, and that (b) the necessary instruction was imparted in a shorter time.

In one firm employing the "school" method I was given a brief outline of the technique. This concern, which

had four branch factories in one large town had taken the smallest and converted it into a training centre.

Advance Training Will Spot Special Aptitude Of Workers

This school also acted as a useful "filter," an executive told me. "We not only train recruits," he said, "but here we can spot special aptitudes (and deficiencies) and can more accurately allocate trainees to work for which they show some natural capacity. This very greatly assists towards stabilising labour in the factories later on as there is less likelihood of women subsequently finding that they do not like the work once they have started on the production line."

In one particular firm specialising in a most important item in the armaments programme the works manager said of his women recruits: "We can train them all right but we can't hold them for more than a month on the job in the factory."

This firm had a small training school staffed by really good instructors so that I could not see any obvious reason for this difficulty. But the very fine organisation of the school was itself the probable cause of the trouble.

The School Must Be Like The Factory

The school was beautifully fitted up; it was more like an academy or a college and the trainees enjoyed all the amenities and attractive conditions usually accorded to students in the professions. The firm was very proud of its school, and the students quite obviously liked it, but, the contrast between this and the hurly-burly of the factory to which they were in due course transferred came as such a shock that, as the works manager said, he couldn't hold them more than a month on the job.

Now that subsequent feeling of (almost) revolt was not the fault of the trainees. They had been, quite innocently, brought up under "false pretences." In its anxiety to do its best the firm was creating an altogether wrong impression of what it expected its trained women to do, so that when they came to mix in with a real factory crowd under conditions of very high pressure work and much more spartan conditions and discipline numbers of them just couldn't, or wouldn't, take it.

As a compromise, many firms are enlisting the aid of Government sponsored local training centres to give special instruction.

The authorities are very happy to co-operate in including their curriculum training in special phases that the local firms require, even accepting equipment and advice from firms' own experts so that they can the more effectively carry out the training required by firms in their areas.

No Tools are Lost Under this New Stores Record System

Losses of Thousands of Pounds Were Stopped by this Simple Method of Checking Issue

EVERY day, year in and year out, in every engineering works, difficulty, dispute and trouble arise over the issue of tools and instruments. This is noticeably the case where the token used for the purpose of a receipt is the brass check.

It is the one sure and safe means for the dishonest employee building up private tool kit, and acquiring a comprehensive equipment. It is also an incentive to the scrupulous to side track their principles, should the desire exist to possess a certain tool or instrument. It would never be missed, and it can always be pleaded: "The check was misrepresented or wrongly placed on the recording rack."

Losses of Thousands of Pounds Can Be Saved

To solve this problem, and to stop the continual yearly loss which in big shops amounts to thousands of pounds yearly, the system briefly outlined was evolved. In the first factory it was tried out in, this system brought to an end:—

- (a) The denial of receipt of a tool.
- (b) The return of a tool to the stores different from that taken out.
- (c) The gaining of tools by the misappropriation of checks.
- (d) The misallotment of checks by the store-keeper.

- (e) The absence of any record establishing who are the principal offenders in the damaging and breaking of tools.
- (f) The difficulty, which flows from this, of discovering in which sections the chief offenders in the returning of damaged and broken tools are working.
- (g) The difficulty of ascertaining, the care taken in the initial tool setting, by tracing the number of stoppages in any given operation due to tool trouble.
- (h) Inability to assess the cost of tool rehabilitation on any component of work in progress.

Results have been achieved taking these three steps. (1) The planning of a system of cards, which check the life of every tool, jig or fixture. (2) The suppression of the brass check and the substitution of a triple docket control which is as infallible as human skill can render it. (3) Institution of section tool rehabilitation and replacement.

Of the card series developed, the first is a master card, giving the life of every jig fixture and special production tool from the day of its receipt by the

stores until the time of its ultimate disposal. The master cards records:—

- (a) The type of tool.
- (b) The number of tool.
- (c) The maker.
- (d) Date received by stores.
- (e) Date when shop superintendent was notified.
- (f) Part number on which tool is used.
- (g) Description of the tool.
- (h) The unit the tool is used on.
- (i) The operation number.
- (j) Other parts to which the tool may be allocated.

The Master Card Contains Full History of Tool

The card also gives the number of the bin in which the tool is kept. The serial number of the card itself (in the top right hand corner) shows the total number of tools constructed or put into use at the date of the record's issue. The body of the master card gives the dates when the tool was issued to the shop, the date when it was returned to stores, and the date on which it was inspected.

ANALYSIS OF SHOP SECTION TOOL MAINTENANCE COSTS.														
HENRY MEADOWS LTD.										Checked by.....				
Date.....										Foreman.....				
Section.....														
NAME		CHECK No.	TOOL	DAMAGE	UNIT	COMPONENT No.	DESCRIPTION	COST.						
Card No. 4984 Date Received..... Bin No. Maker..... Shop Supt..... Unit used on..... Op. No..... JIG AND FIXTURE TOOL RECORD. Type..... Plan Adv..... Part No..... Also used for..... Date Issued to Shop..... Date Returned to Stores..... Date Iss. for Insp..... S.I.R. No..... Date Ret. from Insp..... I.R. No..... Date Sent for Repair..... S.R.N. No..... Date Returned from Repair..... T.R.N. No..... TOOL & INSTRUMENT REQUISITION. NAME..... DATE..... CLOCK No..... SECTN..... COMPT. No..... BIN No..... Return This Check with Tool. SIZE..... TOOL OR INSTRUMENT..... DATE RET'D..... CONDITION..... ISSUED FOR REPAIR..... DATE REP'D..... RATE..... COST..... M..... L..... HRS..... MINS..... CARD INDEX.														

BUSINESS Guide to War-Time Law

By JOHN BURKE, Barrister-at-Law

Editor: Loose-Leaf War Legislation;

Encyclopædia of War Damage and Compensation

Mr. Burke, one of the leading authorities on business law, prepares this digest to explain briefly every important Act, Order or Regulation coming into operation during the current month. Many hundreds of readers have already been helped by this feature. If you have any problems arising from war-time legislation, not dealt with yet, write to the Editor for information and guidance

The notes which follow cover the period from June 15, 1941. They are arranged in alphabetical order and numbered. A cumulative index is to be found at the end of the feature.

The references in these notes, e.g. S.R. & O. 1941 No. 688 are references to the statutory Rules and Orders of 1941 published by the Stationery Office.

37. Aliens.

The "curfew" hour for aliens outside the metropolis is 11 p.m. up to August 9, 1941; see S.R. & O. 1941 No. 895.

Employers of persons of allied nationality registered in the International Labour Force are required to keep the prescribed particulars with regard to such persons; S.R. & O. 1941 Nos. 719—724.

38. Coal.

Retail coal prices are now regulated by S.R. & O. 1941 No. 789.

39. Debtors and Conditions.

A considerable extension of the protection given to persons unable owing to war circumstances to meet their obligations is made by the Liabilities (War-Time Adjustments) Act, 1941.

Part II of the Act extends the Courts (Emergency Powers) Acts, 1939 and 1940 (which makes the leave of a court necessary in order to enforce payment of a debt) to contracts made since the war.

Part I of the Act provides for two kinds of protection. The first is a scheme of arrangement effected through the good offices of an officer of the County Court called the liabilities adjustment officer. This can only be carried through if all or the majority in numbers and value of the creditors are willing to consent to it. If such a majority can be obtained and the scheme is approved by the liabilities adjustment officer it will be binding on all the creditors, but a creditor who has not given his consent to the scheme may apply to the County Court to have the scheme varied or set aside.

The Act applies both to partnerships and to limited companies.

40. Export of Goods.

See S.R. & O. 1941 Nos. 742, 751, 861, 883.

41. Finance Regulations.

Securities specified in a Restriction Order may not be dealt with in any way which affects the rights or powers of the owner in relation thereto. The owner cannot, e.g. make a declaration of trust or give an option to purchase. Where an Acquisition Order has been made the owner may be required to sell the security as directed by the Treasury. It is now the specific duty of a company secretary or registrar not to register in respect of any security an address outside the sterling area except by way of substitution for another such address in the same currency area or for the purpose of a transfer for which permission has been

granted by the Treasury. The restrictions on payments to persons outside the sterling area are tightened up still further. The obligation of persons who are owed debts payable in foreign currency to collect those debts promptly is extended to persons who are owed debts payable abroad in sterling. The general definitions of "owner" and "security" are replaced by wider definitions; S.R. & O. 1941 No. 755.

42. Food.

Bacon: prices; S.R. & O. 1941 No. 864.

Cocoa: control; S.R. & O. 1941 No. 865.

Eggs: control and prices; S.R. & O. 1941 Nos. 888, 889, 927.

Livestock: control; S.R. & O. 1941 No. 795; sales No. 806.

Peas, Beans and Lentils: prices; S.R. & O. 1941 No. 890.

Potatoes: crop control; S.R. & O. 1941 No. 823; lifting; No. 922.

Rationing: edible offals; S.R. & O. 1941 No. 786; butter, margarine and cheese; No. 928.

Syrup and Treacle: prices; S.R. & O. 1941 No. 891.

Tea: prices; S.R. & O. 1941 No. 859.

Tomatoes: home grown, prices; S.R. & O. 1941 No. 853.

Vegetables: canned; S.R. & O. 1941 No. 866.

43. Gas Supply.

Gas undertakings are forbidden to publish their accounts; S.R. & O. 1941 Nos. 879, 881 and are relieved of the obligation of including a copy of the balance sheet in the annual return; No. 880.

44. Industry.

See the Essential Work (Building and Civil Engineering) Order, 1941 (S.R. & O. 1941 No. 822). Cotton industry; see S.R. & O. 1941 No. 843.

45. Limitation of Supplies.

See S.R. & O. 1941 Nos. 820, 836, 837 (miscellaneous); Nos. 820, 821 (woven textiles).

46. National Service.

Maiming or injuring a person or administering drugs to him in order to avoid national service (military or civil) is an offence punishable with penal servitude; S.R. & O. 1941 No. 752.

The A.P.S. is declared to be a civil defence force for service in which a person may be called up; S.R. & O. 1941 No. 775.

As to the discharge or transfer of persons called up for service in the Police War Reserve or A.P.S. see S.R. & O. 1941 No. 776.

47. Petrol Rationing.

The Motor Fuel Rationing Order, 1941 (see para. 39, June, 1941) has been slightly amended (1) as regards the percentage allowance to dealers, (2) as regards the use of coupons, (3) as regards the production of coupons on demand; S.R. & O. 1941 No. 905.

For special restrictions on supply see S.R. & O. 1941 No. 834.

48. Railway.

Requisitioning of new privately owned wagons; S.R. & O. 1941, No. 811.

49. Raw Materials, Manufactures and Commodities.

Chlorates: control; S.R. & O. 1941 No. 827.

Fertilisers: control; S.R. & O. 1941 Nos. 907—909.

Fish: prices; S.R. & O. 1941 No. 924.

Machinery and plant: control; S.R. & O. 1941 Nos. 777, 778.

Molasses and Industrial Alcohol: control; S.R. & O. 1941 No. 738.

Paper: supply; S.R. & O. 1941 No. 730; relaxation as regards programmes; No. 736.

50. Shipping.

Amendments have been made in the Merchant Shipping Act, 1894, as to the engagement and discharge of the crews of merchant ships; S.R. & O. 1941 No. 860. As to navigation and anchor lights, see No. 869.

51. Trading with the Enemy.

Persons who are liable to pay money to the Custodian of Enemy Property must inform the custodian of the fact within 14 days of the date when the money becomes payable and give the custodian such information as he may require; S.R. & O. 1941 No. 765.

The custodian is not to charge percentage fees on money paid to him in respect of persons resident or carrying on business in the Channel Islands; S.R. & O. 1941 No. 806.

A new order has been made enabling the payment of fees to obtain the grant or renewal of patents or the registration or renewal of registration of designs or trade marks in enemy territory. Similar provision is made to enable enemies to protect patents, designs and trade marks in this country; S.R. & O. 1941 No. 794.

52. War Damage.

The free grants scheme in respect of the private chattels of householders has now been made the subject of an order. War damage to private chattels occurring before April 30, 1941, and to business chattels occurring before April 17 may be compensated as if the chattels had been insured, a suitable deduction being made in respect of premiums. No payment will be made in respect of goods which could have been insured under the War Risks Insurance Scheme. Payments to non-residents are severely restricted; War Damage to Goods (General) Regulations, 1941 (S.R. & O. 1941 No. 787).

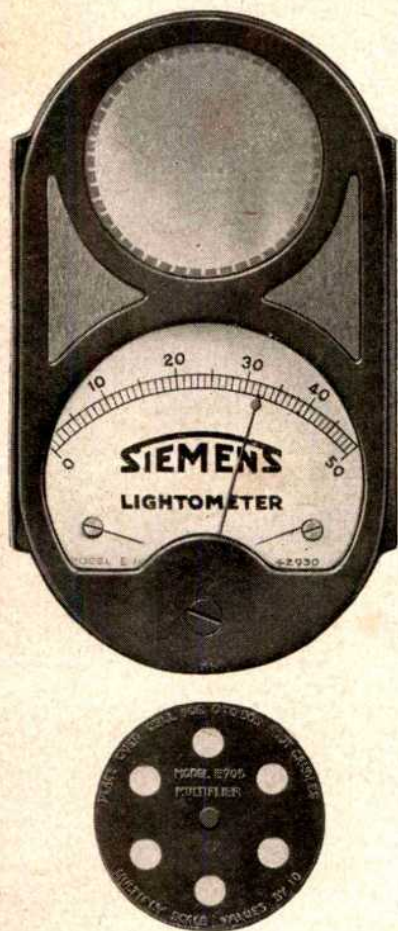
Assessments of instalments of contribution payable in respect of land and fixed plant and machinery under Part I of the War Damage Act, 1941, are made by the Inspector of Taxes. Applications for adjustment or for the deferment of payment of an instalment on the ground of unfitness by war damage are to be made to the Inspector within 30 days after receipt of the demand note; see the War Damage Contribution Regulations, 1941 (S.R. & O. 1941 No. 845).

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LIGHT isn't Watts or Candle-Power . . . It's What the Bulb is Giving You!



**Lightmeters will tell you if your
Lighting is up to Government Standards**

stand or fall by the evidence of a lightmeter. One of the most common reasons for slow or faulty workmanship can thus be remedied. The evidence of lightmeters has already been used in legal proceedings. This fact alone demonstrates the reliability of their readings.

New jobs, new operations are constantly cropping up and each has its

This lightmeter can play as important a part as a thermometer in the maintenance of good working conditions in your factory or office

individual lighting requirements. Work may have to be done on vertical surfaces. Is the light sufficient? How does it compare with the Government recommendations? That point is easily settled by the lightmeter. Is there any relation between the hourly output and the illumination levels? Again a lightmeter is essential in determining the ideal, or at least the most practical illumination.

Don't wait until the factory is in semi-darkness before lighting up. Let the electrician be guided by the direct indication of the lightmeter. If the natural lighting in your workshops is patchy, lights should be switched on in the dark corners. Again the decision of the lightmeter is the only reliable one.

How a Modern Lightmeter Works

Modern lightmeters are entirely self-contained and need no batteries or auxiliaries. They consist essentially of two parts: a light-sensitive cell which generates current when light falls on it, and a micro-ammeter, worked by this current, which moves a pointer over a scale calibrated in foot-candles. This instrument thus gives a direct reading of illumination at the point where the cell is placed, and in the plane in which the cell lies. This latter is important—it is useless to try to read the illumination on, say a desk, by placing the lightmeter there with its sensitive cell facing the wall. In this

instance, the cell must obviously be placed horizontal and facing upwards, as the desk top does.

In most cases, when taking readings, ensure that your own shadow does not fall on the cell, otherwise a false low reading will be obtained. On the other hand, in the case of a machine, for instance, if the measured illumination at the working point falls from 20 down to 5 foot-candles when the operator stands in his normal position this is conclusive proof that the lighting layout needs attention.

Value In Foot-Candles Is The Way To Judge Lighting

Normally, we are not particularly interested in what is happening in the lamp fitting above—what we really are interested in is the resultant illumination which falls on our books, workbenches, desks and counters, thus enabling us to see. Neither the wattage nor the candle-power of the lamp helps us to see. The only thing which concerns us is the effect by these quantities, i.e. the illumination value in foot-candles.

The value of illumination we employ must, of course, be reasonably economical, but the difficulty of seeing small objects, or dark objects against a slightly lighter background, is so great that much more illumination is justified than for larger or lighter coloured objects. Therefore, the Government illumination recommendations for the occupation vary considerably with the severity of the visual task.

Dirty Fittings Will Mean Heavy Loss Of Light

Lack of attention to the maintenance of lighting fittings and lamps is the main cause of poor light in many factories, even where the actual lighting equipment is adequate. The effects of dust and dirt collection on fittings is illustrated in the graph below.

The most effective means of main-

(Please turn to page 31)

THE new Factory Lighting Regulations were described in detail in the June issue of BUSINESS. They require that effective provision shall be made for securing and maintaining sufficient and suitable lighting, whether natural or artificial in every part of a factory in which people are working or passing.

The law has set many factory managements wondering whether their lighting installations are up to the necessary standard. A lightmeter will show them simply and effectively.

A Two-Minute Light Test Will Settle All Arguments

A lightmeter is generally used to check up on a new or reconditioned installation, but its usefulness should not end there. The equipment may be losing efficiency through dust, dirt and the ageing of poor quality lamps. This gradual deterioration may pass unnoticed unless a lightmeter is used at regular intervals.

When a new machine is installed measure the illumination at the working point, don't guess it. You have probably spent a lot of money on it and naturally expect a return in increased output. A two-minute light test is a simple and sensible precaution.

Complaints of "not enough light" can

"IMMEDIATE ACTION, PLEASE"

Production Through Rhythm

SHORTLY after France's fall last year, when a big production drive was urgently needed, the B.B.C. contributed to the Labour Minister's drive with a new feature entitled "Music while you work."

In a scientific survey, the Medical Research Council found that music increased production on a scale ranging from 7 to 11.3 per cent. One man's output soared by 23.1 per cent.

Gradually factories throughout the country installed loudspeakers to carry music to every bench. But, then, the B.B.C. fell down. They forgot that night-shifts existed.

The strain of night-work, especially on long shifts of perhaps 12 hours, has never been disputed. It is rumoured that the Mandarins of Portland Place are at last awakening to the fact that factories are working at nights and that they are contemplating broadcasts for them.

If someone can be found to bear the strain of changing records, it is possible that the night-workers, too, may help to win victory through harmony some time in the distant future.

That Other Rhythm

MR. BEVIN, speaking to representatives of employers and trade unionists recently, made good use of the word "rhythm" as the chief ingredient in a prescription for continuity of purpose.

Nowhere, however, in production is

rhythm more important than in continuity of orders to firms who have specially laid themselves out for certain supplies. Many firms, following the exhortations of the Ministry of Supply to increase their manufacturing capacity, have extended buildings and plant at considerable financial risk.

Then, lack of rhythm in supplies has caused delay in deliveries and the firms have been refused further orders on the grounds they are "not efficient."

The result is not only that the rhythm of manufacture is destroyed but the carefully trained labour has to be dispersed. Or they have to be employed in work of no importance in order to be retained for expected orders (incidentally spreading the "disgruntlement" through the works).

It may be taken as an axiom that no job is ever done thoroughly unless it is someone's particular duty to do it. And there seems to be no one whose job it is to co-ordinate supply.

Production Needs

MR. BEVIN, has also provided the critics with an authoritative text. He said, a week ago, that our airfields and factories are behind; people registered for war work cannot be used because the factories are not built for them to work in.

These facts have been known for months, yet it seems to be nobody's business to remedy them, least of all Mr. Bevin's. The statement has been noted and

will undoubtedly be thrust at Government spokesmen when next they try to blame factory management for unsatisfactory war output.

Economy ?

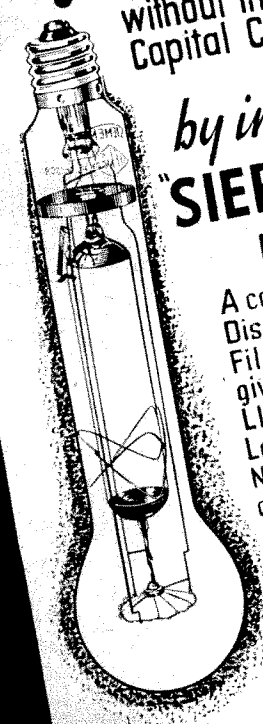
"SAVE Paper" is the message of a circular, printed on fine paper, distributed by a London borough council. One resident has, so far, received five copies of it. Evidently the council does not know what it is asking its ratepayers to do.

The Next Honours List ?

COMRADE ZAGOULOFF, one of Moscow's munition workers, has received honourable mention in the official Russian war communique for an outstanding feat of devotion, skill and endurance. He manned two lathes single-handed for five consecutive days to turn out urgently needed cylinders—a job which normally would occupy 500 working hours.

There is an idea which might be considered worthy of adoption here. No doubt there are British workers whose zeal has moved them to perform prodigious feats in the country's cause. These should rank for honourable mention with other feats of arms.

Russia has struck the right note and we should like to see individuals, and groups—other than civil servants—named in special Honours Lists. We should know then whom to praise—and whom to emulate.



SIEMENS

SIERAY

**? How can I improve my
FACTORY LIGHTING
without incurring high
Capital Cost ?**

by installing
**"SIERAY-DUAL"
LAMPS**

A combination of Electric
Discharge and Tungsten
Filament in one Lamp,
giving UP TO 50% MORE
LIGHT than gasfilled
Lamps of equal wattage.
No choke coil, condenser
or re-wiring required.

**WRITE FOR
CATALOGUE
No 534**

For the Lighting of
**OFFICES, SHOP INTERIORS,
SHOP COUNTERS, SHOWCASES
etc.**

Install
**"SIERAY" FLUORESCENT
TUBE**

It provides an illumination
approximating to natural daylight
with these advantages:

1. Light Efficiency more than
TWICE that of the ordinary
Filament Lamp.
2. Lamps have life of approximately
2000 hours.
3. Cool in operation.

**WRITE FOR
LIST NO.
F.T. 966.**

FREE ADVICE WE WILL GLADLY
SEND A LIGHTING ENGINEER TO ADVISE
YOU ON A LIGHTING LAYOUT USING
EITHER

SIEMENS

TUNGSTEN FILAMENT LAMPS
"SIERAY" ELECTRIC DISCHARGE LAMPS
"SIERAY-DUAL" LAMPS

WE OFFER THIS SERVICE WITHOUT ANY OBLIGATION.

Advt. of SIEMENS ELECTRIC LAMPS AND SUPPLIES LIMITED, 38/39 Upper Thames Street, London, E.C.4

The image shows three overlapping forms from the 'Ledger-Posting System'. The top form is a 'PURCHASE JOURNAL FOR MONTH MAY 1941' with columns for Date, Journal Fol., Debit, Credit, and Transactions. It contains entries for '100 gal. Petrol', '2 new covers', and 'Plugs'. The middle form is a 'REPAIRS & MAINTENANCE' ledger with columns for Date, Description, and Amount. It contains entries for 'Repairing', 'Boring', and 'Plugs'. The bottom form is an 'ALLOCATION' stamp with columns for Date, Description, and Amount. It contains entries for '5/27', '5/28', and '5/29'. The forms are designed to be used together to record and allocate costs.

These three forms are all dealt with in one operation by this valuable system. The allocation stamp, which is used to key all invoices, is shown in the lower right hand corner.

Our Ledger-Posting System Gives Us Simultaneous Costs Analysis

THE frequently changing conditions imposed by the war had made it almost impossible for us to keep our costs analysis as up to date as our various public works contracts demanded.

Control of the wide range of plant, tractors, lorries, etc., necessary in carrying out civil engineering work made the accountancy work too complicated to be satisfactorily handled by ordinary machine-accountancy methods. The many virtues of mechanical accounting could not be adapted to our needs.

We decided, therefore, to introduce a system which gave us the necessary speed, accuracy and duplication of records provided by mechanical accounting, while at the same time it preserved all the flexibility of individual accountancy.

The system was introduced two months ago and already it is possible for us to assert that our costs analysis is as up to date as our journal and ledger posting. Cost accounts and financial accounts are linked up to form one organic whole. Incidentally, the journal and both the personal ledger and the cost account are posted in one operation.

How This Manual—Mechanical System Works

The basis of the whole system is the recording tablet. This consists of a light metal plate, fitted on the left-hand margin with two clamping bars. The principal divisions of our

All the advantages of Individual Accountancy can be combined with Mechanical Systems

By L. W. J. OWLER, A.C.I.S.

Secretary and Chief Accountant, J. A. Stirling Ltd. (Public Works Contractors) and Lea Valley Demolition & Excavation Co. Ltd.

diture, contracts expenditure, upkeep of plant and vehicles, and, of course, revenue. To cover these specially designed stationery was introduced, loose-leaf, carefully cut and printed, so that when placed in position on the recording tablet all spacings align exactly.

Following the usual mechanical accounting method, the posting is carried out from the original record, such as an invoice, direct to the ledger sheet, omitting the separate journal entry. Since three or four different sheets can be dealt with on the recording tablet at once, a master or control sheet is prepared simultaneously with the ledger posting.

Journal and Ledger Posting In One Operation

The routine is as follows: an invoice is first marked with the "allocation" stamp, which bears both the account number of the customer or supplier and that of the section of the costs account to which it relates. The entering clerk takes the recording tablet and inserts the master sheet under the second clamp. He then inserts successively the

from the cabinet, placing that to be credited under the top clamp in such a position that the next vacant line on the sheet is immediately super-imposed upon the next vacant line on the journal sheet. The journal sheet contains an extra column, which projects beyond the ledger sheet when in position. This is used to indicate, for the purpose of positioning the next ledger sheet, the line on which the last entry was made.

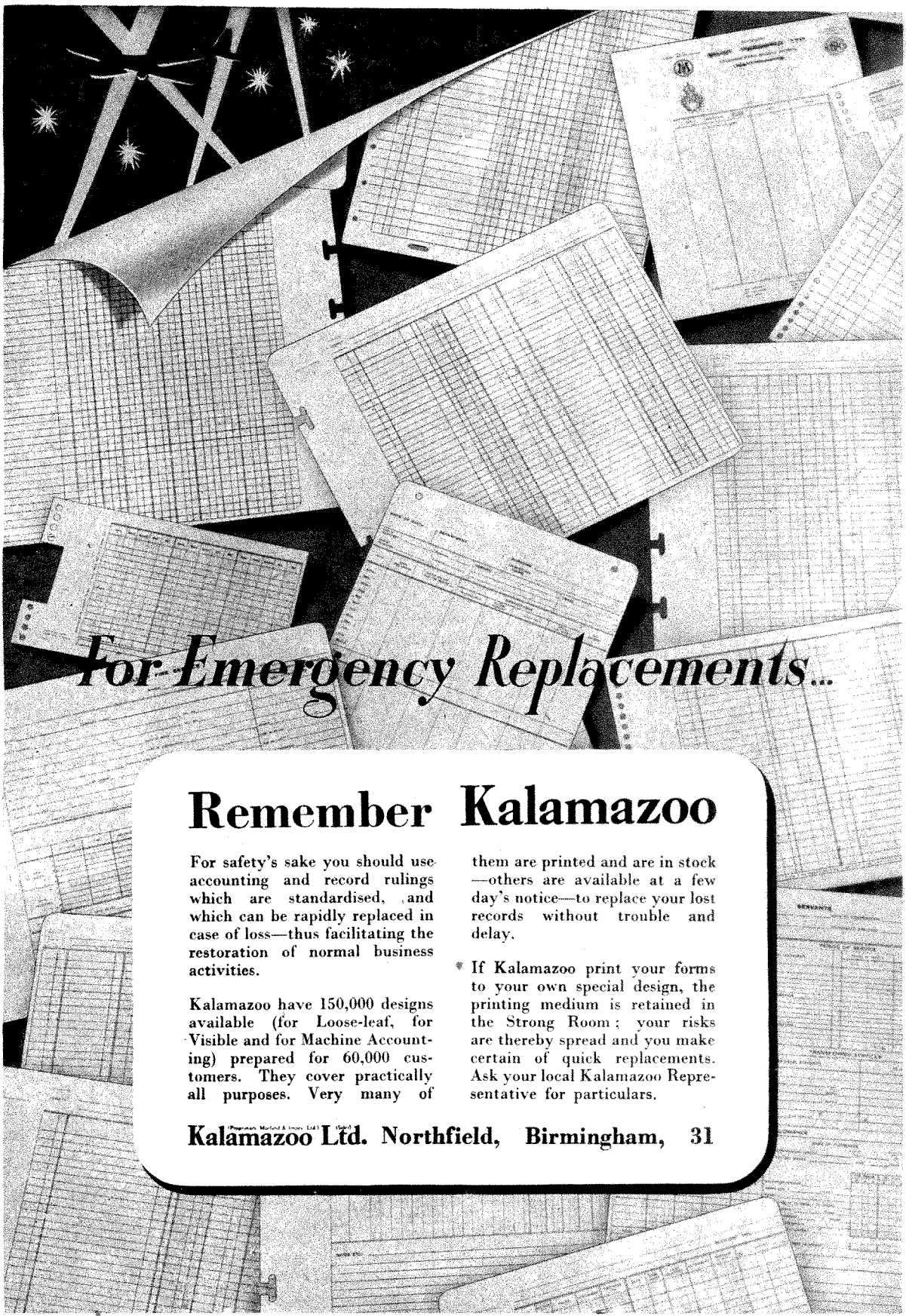
An Error Can Be Discovered Immediately

When all the entering is completed, a cast of the journal gives a control total, which can be checked independently by a straight list of the invoice totals.

Any error in posting can be tracked down with the greatest simplicity. In the first case, it would be revealed by a difference in the totals of journal and check list.

The storage cabinet for ledger sheets is of normal design, except that it is equipped with metal plates for the purpose of dividing the sheets into con-

(Please turn to page 32)



For Emergency Replacements...

Remember Kalamazoo

For safety's sake you should use accounting and record rulings which are standardised, and which can be rapidly replaced in case of loss—thus facilitating the restoration of normal business activities.

Kalamazoo have 150,000 designs available (for Loose-leaf, for Visible and for Machine Accounting) prepared for 60,000 customers. They cover practically all purposes. Very many of

them are printed and are in stock—others are available at a few day's notice—to replace your lost records without trouble and delay.

* If Kalamazoo print your forms to your own special design, the printing medium is retained in the Strong Room; your risks are thereby spread and you make certain of quick replacements. Ask your local Kalamazoo Representative for particulars.

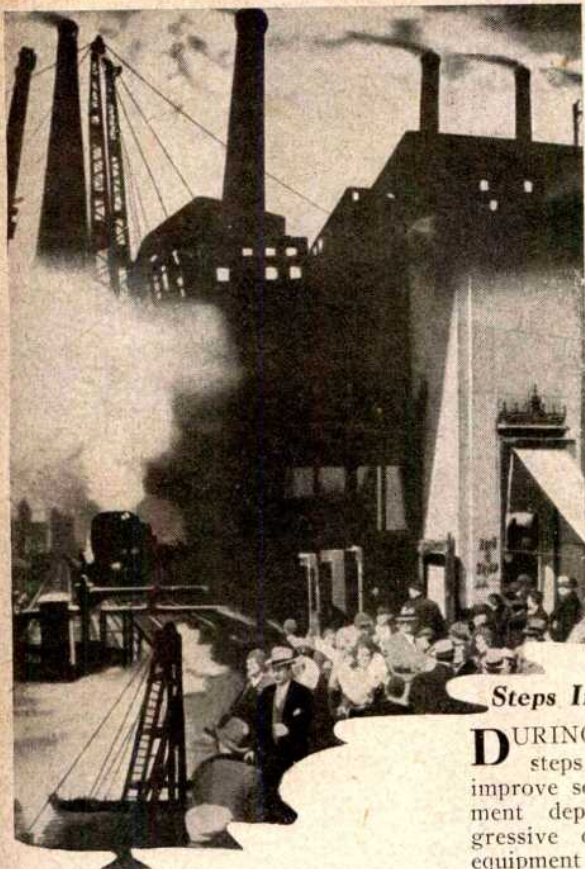
Kalamazoo Ltd. Northfield, Birmingham, 31

TREND OF TRADE

There Must be a Ceiling to Wages

Says CECIL CHISHOLM, M.A.,

Business Consultant



summarised thus:—

The actual need for, and the individual cost of income tax should be explained to the worker.

A ceiling must be put to wages.

Steps In The Right Direction

DURING the month a number of steps have been taken that may improve some of the present Government departmental technique. Progressive demands for building and equipment expansion are becoming more general. A new advisory committee to the production executive should bring a more practical point of view to the Common's deliberations. Better still is the transformation of the Area Board into the Production Executives' Regional Board.

The control of the innumerable labour controls will now fall under Sir Andrew Duncan. Being so much taken up with the Export Groups and concentration I doubt whether Capt. Lyttleton was able to turn his energies in this direction, but the past performance of Sir Andrew Duncan gives no promise of anything better. Fortunately, placid Sir Andrew will probably come under the impact of the dynamic Lord Beaverbrook before many days are past.

The second crucial problem is that of wages. The T.U.C.'s defence is that it is unable to control the activities of its unions in seeking higher wages. Still a ceiling must be put to wages if prices are controlled. Is there any reason why wages should not be controlled now that so wide a range of prices are controlled?

The Fight Against Inflation Goes On

MEANTIME the fight against inflation goes steadily on with varying success. Wholesale prices have now risen by around 50 per cent. The cost of living is up by 29 per cent., for what that figure is worth. The level of wages is up by 20 per cent. and the currency in circulation has risen from an average of £478 million in 1939 to £604 million in May of this year, a rise of well over 25 per cent.

chasing power has risen in various classes of the community from at least 25—30 per cent., the goods available have probably fallen in volume by at least one-third. Here are all the elements for inflation. There are, however, three useful brakes on the process. The first is that of saving, the second is the fall in income among the rentier class, the commercial community and the few workers in the luxury industries. The third is rationing, which automatically compels saving.

The effect of the rationing of clothing cannot yet be estimated. But shop sales for May were down by 3.5 per cent., which means at least 32.5 per cent. in volume and probably 40%.

Actual sales are still up, in spite of rationing, in Scotland, the North-east coast, the North-west and the Midlands, the North-west leading.

In the South of England there is a fall in money sales by 1.5 per cent.; in central and west London by 8.9 per cent. and in London suburbs by 12.2 per cent.

Curiously enough, the South of England showed a rise of no less than 44 per cent. in the sale of dress piece-goods in May.

Rayon Industry Leads In Concentration

WHERE stands concentration to-day? Apart from the increasing peril of the small shop-keeper, concentration has almost been in cold storage this month. The departure of Capt. Lyttleton from the Board of Trade meant that the entire scheme had to be studied and sanctioned by his successor. Meantime very few wheels have turned. Probably the rayon industry is farthest advanced. Courtaulds' are closing two factories in the munitions areas and concentrating production very largely in their own mass production factory. The smaller viscose producers have made their own concentrations.

This vital young industry has secured Mr. Bevin more men and women workers and reduced costs by cutting out all but the more necessary types of yarn. In other words, a drastic programme of simplification has been applied to the industry.

FOR the first time in this war, business has been heavily under fire. Charges of mis-management in war works particularly have come not merely from the workers but from outside sources. M.P.s, civil servants, newspapers, and some industrial correspondents have all taken a hand in the game. The debate in the House was unusually uninformed even for the Commons. The reason for this attack is not far to seek. Quite reasonable complaints made by experienced employers about absenteeism were twisted and exaggerated by the newspapers and even more grossly exaggerated by publicity-seeking M.P.s.

Business Counter Attacks With Vigour

FOR once business associations have replied specifically and forcefully to the charges. Instead of the usual wordage, the Government and public have been given facts and figures, logical arguments backed by specific instances.

Let no one suppose the good name of business does not matter. It is going to matter very urgently in the difficult post-war years.

The Case For Business In Three Sentences

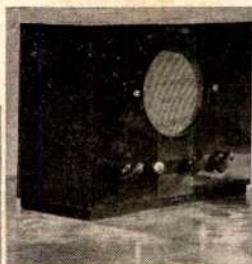
WHAT business is suffering under to-day is neither apathetic workers nor lack of initiative, but Government red tape.



T'S BENJAMIN LIGHTING

SUFFICIENT SUITABLE & EFFICIENT

SIX SHORT CUTS to . . .



. . . Office Efficiency & Economy

Advance Pay-Day Helps New Employees

A MAIL-ORDER house has a plan of wage payment that immediately creates good-will among its new employees—salary in advance of the first pay-day.

Junior grades are paid weekly, and executives monthly. When the new employee has been with the firm but three or four days he or she receives a salary envelope containing one week's or one month's pay in advance, according to the manner in which they are to be paid regularly.

The novelty of the idea, the indication of confidence placed in the employee, and often-times the meeting of an urgent need for money, establish a favourable reaction from the beginning. Later on, when an employee contemplates leaving he is confronted with the fact that he owes one week or one month back salary and this often influences him to continue in the same work without looking about for something else.

Compensation Payments for Accurate Filing

FILING difficulties and mistakes can be overcome by paying filing clerks a basic salary plus a bonus for accurate and speedy work. One firm which has adopted this idea has reduced filing errors by over 75 per cent, and has made work in the filing department much happier for the girls employed. Each clerk is assured of a basic wage, which would not be a bad salary even if no extra bonus was paid.

The bonus payments are based on the volume of letters, forms and documents dealt with, and the number of "look-ups" made. The standard for these tasks was established by a stop-watch study, which determined the time required to file set quantities of the company's mail, as well

as the time it takes to "look-up" a given amount of filed material.

File clerks are expected to attain a pace of at least 80 per cent. of whatever the standard is. The bonus is based on the excess that a girl accomplishes above her quota. The bonus is large enough to put a real incentive into her job. It is obviously a powerful urge for the clerks to do speedy work.

The danger in the system is that a girl might be so anxious to increase her bonus, that she will work too fast, and make a lot of misfilings. This danger is checked by having one of the girls act as overseer. She is paid a larger basic wage and a smaller bonus, so that she is more interested in doing good work than in attaining speed. Her caution succeeds in offsetting any over-zealousness the other girls may have.

Letter Writing Manual Ensures Uniformity

TO obtain uniformity in all outgoing correspondence a standard reference manual should be adopted.

As each typist is employed she should be provided with a copy and asked to study it for standard forms of letter writing and to refer to it whenever she is in doubt. An example of the preferred form in letter writing should be given, whether to "block" name, address and salutation, when to indent and how far, proper spacing between date line and name of person addressed, between the last line of the address and salutation, between the body of the letter and the complimentary close, etc.

Such regulations in letter writing will soon become automatic with the typist. The manual could also give her other data in letter writing style to which the careful typist will frequently refer. This should include information on how to write sums of money in the text of a letter, what words should or should not be

abbreviated, when to hyphenate, when to use a compound word, how to spell or abbreviate a title and many other details so important to the appearance of a letter and the impression it makes, but which are too numerous for a new typist to memorise.

The manual could also contain a list of preferred spellings of words which have alternative forms.

The manual should not be a guide to accuracy so much as uniformity.

Keep a Perpetual Stationery Inventory

AN accurate check on stationery stocks need only take an hour a day for complete check-up and entry, even if large volumes of two or three thousand different types of forms are handled.

This is possible by the use of small slips about 1½ in. wide containing the form number. This tag also shows the number of units. These slips should be inserted in the piles of stationery at desired intervals. If separated in quantities of one hundred, for example, when the first hundred pieces are issued the tag showing "100" in that particular form number is hung on a near-by hook. These tags are then gathered up each morning and posted at one time on a visible file.

The visible index should show the quantity received to date and quantity which is withdrawn from stock. It should also show a current stock figure, permitting the stock clerk to tell immediately when it is necessary to re-order.

How to File Extra Large and Bulky Reports

WHEN typed or printed reports are larger than normal file sizes, they can be reduced to filing size by means of photo-offset processes. This procedure will save purchasing special size binders and filing cases, as well as helping to reduce filing space.

Simplified Typewriter Speeds Addressing

A LARGE national advertiser, offering a wide range of goods for which there was rarely a repeat order, employed a girl to address labels for the mailings. Because there was only one mailing to each inquiry or order, there was no point in making up address plates.

Using labels in rolls, the girl averaged 1,400 labels daily. Study of her work brought the suggestion that a special typewriter, equipped exclusively with capital letters keys be employed. On this typewriter there are no punctuation marks of any kind—only capital letters and figures. Now the girl has to omit all periods, commas and never needs to shift for capital letters, as all addresses are written in capital letters, thus:

HENRY MARSHALL
246 LONG ROAD
CLAPHAM
LONDON SW4

From 1,400 labels addressed daily production quickly jumped to 2,000 labels with these improvements.

THE NAVY WON'T STAND FOR SHRINKAGE. WHY SHOULD YOU?



THE Diesel engines of a submarine are placed on both sides of the central alleyway in the ship. The men who tend them are well protected in overalls that can't get too short in the legs or arms. That's because the cloth they are made from is mechanically shrunk so that no appreciable further shrinkage can occur.

FOR many jobs overalls are worn by the Navy now just as they are by the other Services.

Naturally, in the Navy, even overalls must be smart — must fit well, must be comfortable, must stand up to hard service. So a first essential for Navy overalls was — the cloth must not shrink.

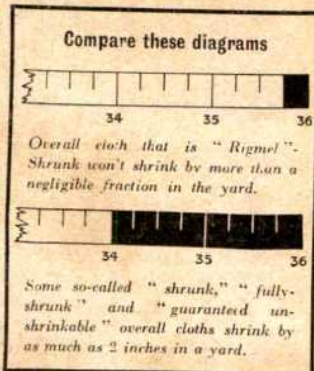
No vague claims of unshrinkability were good enough for the Admiralty. They set a standard of shrinkage tolerance. It is a high one. It allows for no more than $\frac{1}{2}$ of 1% shrinkage in length or 2% in width.

Uncontrolled shrinkage treat-

ments cannot comply with Admiralty standards. Some leave as much as 2 inches of shrinkage in the yard. See the difference between them and "Rigmel" mechanical shrinkage on the diagram below! No wonder mechanical shrinkage is wanted by the Navy!

Why not let your workers have overalls that are up to Navy standards in terms of non-shrinking? They don't shrink, they offer better protection, they look smarter, they keep their fit and comfort and they wear longer. Usually the cost of "Rigmel" shrinkage is paid by what you save on overall replacements and repairs alone. And it is well known that the output of workers improves when they are smartly and comfortably clad.

Most suppliers have "Rigmel". Shrunk overall cloth. Protective garments made from it are available through retail outlets for purchasers of small quantities.



"Rigmel"-Shrunk Laundry-tested against Shrinkage

Advertisement of THE BRADFORD DYERS' ASSOCIATION LIMITED
LONDON · BRADFORD · MANCHESTER



Thank
you
M^r. Ediphone -



THEIR MAIL COMES
THRO ON THE
EARLY COLLECTIONS
NOW

"It's easy enough to say 'Post Early'... and lots of people manage to do it. But there are lots more who never catch anything but the last post. It's not for want of trying either... but the boss can't understand why! I could tell him. It's first come — first served these days. And the first to come along... every day... are from the firms who use the Ediphone. Their correspondence is an easy methodical progress... not an all-day battle. And because they are organised in the modern way, it enables us to do a good job of work, even in these days!"

EDIPHONE SYSTEM OF
Voice-Writing

Write for full particulars
or Free Demonstration
at your desk without
obligation.

For recording Telephone
conversations, Board-
room conferences,
Minutes of public
meetings, speeches, etc.
use the TELEDIPHONE.

THOMAS A. EDISON LTD., VICTORIA HOUSE,
SOUTHAMPTON ROW, LONDON, W.C. 1.
Telephone: HOLBORN 9988 — Branches and Dealers in all principal cities.

A.R.P. for the Factory and Office

Fire-Fighting Efficiency May Depend on Equipment

IN spite of the ever-present danger of fire damage due to enemy action and the every-day industrial fire risks, the lack of proper and adequate fire precaution arrangements in many factories and business premises leaves much to be desired.

These undertakings, both large and small, have until recently, been most inadequately protected from the possible ravages of fire.

Many have now purchased unsuitable equipment. High pressure salesmanship, by representatives of the less reputable firms, must take a large share of the blame for this.

Many works fire brigades are operated

by the works manager, foreman, or, in cases where cost has been the first consideration, by the buyer.

While these persons may be absolutely first class men at their own individual jobs, the majority of them have quite sufficient work to do in their own capacity and have little time in which to worry about fire protection.

With the best will in the world no man without adequate training can possibly organise the internal fire arrangements of any company to the most efficient standard.

Inefficient Buying May Render Equipment Useless

A certain large factory, which I surveyed some time ago, had been instructed to purchase a quantity of hose and branch pipes. This they did, but unfortunately they ordered 2½ inches instantaneous couplings and all the landing valves in this particular building were fitted with London round thread outlets.

In another instance the landing valve was tested for the water supply which was found to be inadequate. After some enquiry, it was discovered that the 2½ inches landing valve was connected to the mains by a 1 inch composition pipe. Somewhat naturally the flow of water was not up to requirements.

Fire Extinguishers Must Be The Type To Fit The Job

I regret to say that many organisations consider that once they have bought fire extinguishers, they have done all that is necessary.

I know of one case where ordinary soda acid type extinguishers were installed for the protection of a very large petrol risk, and in very many cases carbon tetrachloride extinguishers have been installed for office protection. There is, as is now well known, a definite source of danger in the use of these owing to the possibility of production of toxic gases.



Incendiary Bombs Sound Automatic Alarms

AUTOMATIC bomb detection is to become standardised. The British Standards Institution have now issued a further A.R.P. specification (BSI/ARP55). This specification has been prepared at the request of the Ministry of Home Security. It deals with systems for the detection of incendiary bombs by an audible alarm, operated by the impact of a falling bomb which ruptures the "detector conductor" of a closed electrical circuit.

The general principle of the device is that the detector-conductor is erected over the area to be protected in such a manner that a bomb falling within the area will fracture it.

There is in existence already such a closed current circuit system. This is manufactured by a well-known burglar and fire alarm company. They state they have some original patents in connection with closed circuit alarms.

The main feature of the alarm is the suspension at four-inch intervals of special copper wire immediately beneath the roof. The system can be installed on buildings of any size. The system may also be

(Continued at foot of next column)

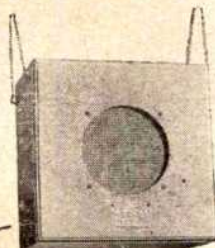
In this regular feature ways and means of improving the A.R.P. organisation are discussed for the benefit of Executives in charge of A.R.P. Readers of BUSINESS are invited to send their A.R.P. queries to the editor. Information on every aspect of Civil Defence is available.

Three new A.R.P. Devices are described on pages 28 and 29.

(Continued from previous column)

installed in a group of buildings, the alarm being sounded in a central control room. The exact location is given by an indicator board.

A further method of ensuring that detection occurs immediately lies in the provision of thermostats fixed in the protected building at points where protection by a system of wires cannot be obtained. This latter addition ensures that fires caused by incendiary bombs entering the building obliquely are signalled immediately they start.



Box-type factory speaker

ROOF-SPOTTERS

INSTANT ACTION . . . GREATER SAFETY . . . IDEAL WARNING SYSTEM

This installation gives the perfect way of transmitting the Roof-spotter's warning and also announces the return to work with the minimum loss of time. The same installation broadcasts music, a wonderful antidote to fatigue, and will locate any executive urgently required. Information, demonstration, survey, estimates, or rental terms—free on request. 'Twenty-five years' experience at your disposal in manufacture, installation and maintenance. A test gladly arranged at your own works.

DICTOGRAPH SOUND INSTALLATIONS

(Dictograph Telephones Limited)

ABBEE HOUSE, WESTMINSTER, S.W.1

Abb 5572 (3 lines)

AURELIA ROAD . . . CROYDON

Tho 2427 (2 lines)

CONTROL OF STAFF DURING AIR RAIDS · MASS ADDRESS TO EMPLOYEES · ACCIDENT, FIRE BURGLAR AND SABOTAGE ALARMS · AIR RAID WARNING DETECTOR · STAFF LOCATION AND MUSIC IN FACTORIES
ALSO INTERNAL TELEPHONE INSTALLATIONS

Branches at BIRMINGHAM · MANCHESTER · GLASGOW · LEEDS · NEWCASTLE · BRISTOL · CARDIFF



GEARED for Efficient Output

To keep all the wheels—in all the departments—turning at top speed all the time . . . why, that sounds like millenium. But it's the sort of problem that Kardex is tackling, and solving daily.

There's a reason. Kardex experts understand not only the pitfalls of your industry, but the pitfalls of system planning too. They provide simple, practical, action-compelling solutions. Let them talk over your problems, and plan for more efficient production.

KARDEX

Write for stock and planning Leaflets to Dept.: 351.
KARDEX VISIBLE CONTROL SYSTEMS,
 1 New Oxford Street, London, W.C.1.
 Tel.: CHAncery 8888

PRODUCTION CONTROL

A system that was recently referred to in the "Factory Manager" as one of "the most flexible and modern Factory-work record systems available" is the

27
 0287
 356
 12
 1/1

MACHINING

INTERNATIONAL TICKETOGRAPH SYSTEM OF PRODUCTION CONTROL

It will maintain operation costs already fixed in advance, and it will show the position of every job as it proceeds through the Works

Ask for copy of new booklet T334/9 just published, sent free on request.

INTERNATIONAL TIME RECORDING Co. Ltd.
 112 Strand, W.C.2. TEMple Bar 5841

Head Offices: International Works, Beaver Lane, W.6

J323-9

Paper Shortage Makes this Publicity More Vital and Productive than Ever



The restrictions which paper rationing has imposed on all forms of Advertising makes the "System" Desk Calendar a more valuable and effective publicity device and goodwill builder than ever before.

Plan Your 1942 Publicity NOW

Your name or advertisement can be specially overprinted on each of the Daily Sheets of the "System" Desk Calendar so that it will be seen every hour of every day of the year by all of your customers or prospective customers to whom you send it. Once a business man uses the Desk Calendar he goes on using it year after year. It reminds him of engagements, things to be done; saves his time and memory, and enables him better to concentrate on important tasks.

And yet the cost is remarkably small in comparison with the benefits that it gives you and the goodwill it creates.

Without Obligation Post This Coupon Now
For Particulars or Quotations

To **SHAW PUBLISHING Co., Ltd.**,
 6, Carmelite Street, London, E.C.4.

Without incurring any obligation I would like to have your quotation for System Desk Calendars for advertising purposes throughout 1942.

Name
 Address
 C.B.Jy.

ROOF NETTING

as approved in connection with the

FACTORIES
 (GLASS PROTECTION)
ORDER 1940

Available from stock
 Complete Schemes of
 ROOF PROTECTION
 carried out

Also

CAMOUFLAGE

Estimates and full particulars from
PICKERING & HALDANES

Netting Specialists

SOUTHAMPTON HOUSE, PELHAM ROAD,
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Telegrams—"Camnets"

Do These Amazing
Alterations by
the

TRAPINEX

Paint
PROCESSES

Cover
Your Problems?

We have changed the brand on many thousands of celluloid-covered showcards; on giant advertising clocks throughout the country without removing them from sites; metal advertising plates have been cut and turned into smaller signs for new brands; Grape Fruit showcards have been resurfaced completely with windmill design advertising bread; cosmetic tins have had brand altered in small recess and around edge; celluloid instruction sheets have had address changed; metal showcards have had new label added to coffee tin forming part of the illustration; white prices on black ground have been replaced with white slogan on bus streamers.

These are only a few of the many alterations we have effected and in every case our clients consider that we have actually enhanced the advertising value of their material.

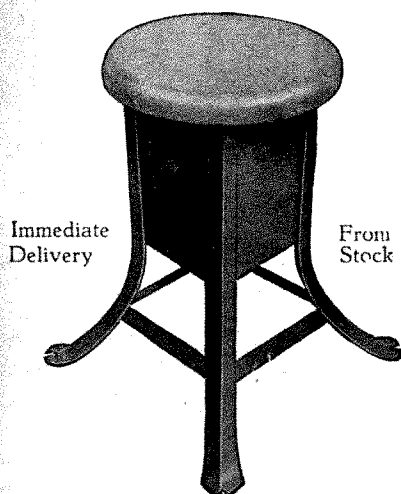
Send us details of your requirements for alterations, new display material or transfers, and we will gladly quote you. Please do not ask for price list as all work is individual to clients' requirements.

TRAPINEX LTD.

8 Commerce Works,
43 Commerce Rd., London, N.22

BOWES PARK 2689

FACTORY and
WORKS SEATING



THE "KEMCLO" STOOL

as illustrated 13/- delivered;
17/6 with Back Rest.

Model 2—Extra large compartment and special seat 25/-.

- *ALL METAL CONSTRUCTION
- *LOCKER COMPARTMENT UNDER SEAT (hinged to form cover).
- *CAN BE CONSTRUCTED & MADE TO CUSTOMERS' OWN HEIGHTS & SUGGESTIONS.

"KEMCLO" Mftg. Co.
55 Netherwood St., London, N.W.6.
MAIda Vale 1331.

NEW for the Office and Lighting

1 WAGE CALCULATIONS MADE AUTOMATICALLY

War-time working hours, some at normal rate and others at various degrees of overtime payment, impose a heavy strain on the wages department of any factory. Since speed is as essential as accuracy in the preparation of wages sheets, a lightning calculator, which permits the amount due for work at both the normal rate for a 47-hour week and for overtime at two different rates to be picked out at a glance, should prove of considerable value to wages clerks.

A calculator which has this performance, working on the principle of a slide rule, has just been introduced and is already finding a wide market all over the country. Many big factories on work of national importance have purchased several dozens of them.

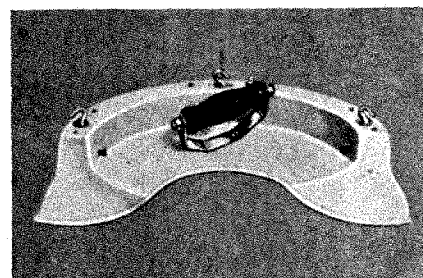
It is estimated that a reduction of two-thirds in the total time spent in wage calculations is possible with one of these wage slide rules. They give calculations at all wage rates from 6d. to 2s. 6d. per

hour, worked out for a 47-hour week and for all intermediary hours from 2 to 46. In addition, overtime for all fractions from one quarter to twelve hours, at two scales, can be seen at a glance. All told, 2,350 different wage rates are given.

2 HANDBOOK OF WORKSHOP CALCULATIONS

War needs have induced the Board of Education and the Ministry of Labour and National Service to provide a handy pocket size booklet which is a beginner's guide to workshop calculations. It has just been published at a price well within the reach of engineering trainees.

The book contains 40 pages of graduated exercises and answers, with diagrams and worked examples. The elementary stages



The bench lighting unit described in paragraph 7

lead on to the more involved calculations to be found in workshop practice, and worked examples and ample explanations are given at each stage. The handbook should prove to be an invaluable aid to workers making their first contact with the engineering industry, whether in government training centres, technical colleges or workshops.

3 AUTOMATIC FIRE BOMB DETECTION

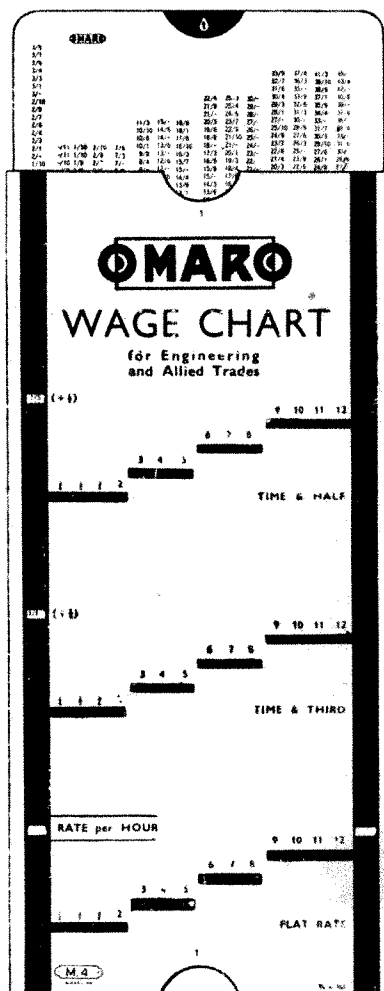
Incendiary bombs can now be automatically detected by adaptation of the apparatus used for many years by the L.P.T.B. for traffic records, for protecting the Crown jewels at the Tower of London and guarding many of the valuables which have been exhibited at Burlington House.

The detector units can be placed inside or outside of buildings. Each detector will cover an uninterrupted area of 8,000—10,000 sq. ft. and is connected to the ordinary electric light system, and then, via auxiliary gear, to an alarm bell and bomb locator in the control room. This locator will show the exact place where an incendiary has dropped and so permits the chief fire-guard to dispose his squad to the best possible advantage.

The use of automatic fire bomb detectors frees the human watchers from the hack-work and unnecessary hazards of shrapnel, leaving them available for their real job of fire prevention.

4 GAS-PROOF AIR VENTS FOR SHELTERS

Special ventilator bricks, which permit the free passage of air when it is not contaminated but which can be instantaneously sealed in the event of a gas attack, have just been introduced for A.R.P. shelter construction. These bricks are available in both the standard sizes of bricks. The control of the ventilator is by a short supporting bar, which, when released, hermetically sealed all the joints.



The wage calculator, showing one side of the "slide rule" chart partly withdrawn

5 IMPROVED INCENDIARY BOMB EXTINGUISHER

An important improvement has been made in the fire bomb extinguisher described in the February issue of *BUSINESS*. The pump, which was originally attached to the outside of the container, is now embodied inside the container thereby making it easier to handle and easier to pump, beside giving a greatly improved appearance. The pump itself is now more powerful and requires only about 60 to 70 strokes to bring the pressure up to 60 lbs., as against the 130 strokes required by the old pump.

6 LOCALISED LIGHTS FOR INDUSTRIAL PLANTS

Three different models of localised light fittings, complete with low-voltage transformer units and adjustable arms, have just been introduced. They can easily be



One of three new localised lighting units

installed on a wall or other permanent upright and can be adapted to meet practically any industrial lighting requirements.

7 BENCH LIGHT UNIT FOR CLOSE WORK

Concentrated light free from hard shadows is provided by a new fixture, which is suitable for local illumination of assembly tables, work benches, drawing boards and similar areas. Semi-circular reflector is of anodised aluminium. It accommodates a standard 6½ in. radius 60-watt half-circle architectural lamp.

8 ELECTRIC EYE DEVICES TO SAVE LABOUR

The selenium cell-light ray system, frequently employed for traffic control and similar purposes, has been adapted to no less than seven different types of control methods. All of these new ways of using the light ray will permit the complete release of all manual or supervisory labour except for inspection purposes.

The new adaptations range from counting units of any product as they pass on a belt or roller conveyor to controlling the electric heat treatment of steel bars. Other new ideas for the use of the electric eye provide for the detection of noxious

NEW for Transport, Factory ARP

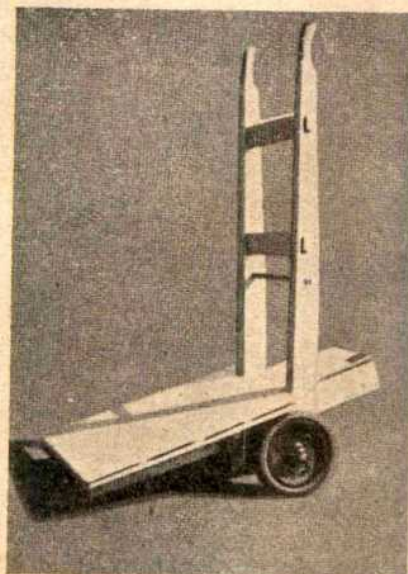
•Readers are invited to make use of this valuable information. The name and address of the manufacturer of any product described may be had on application to the Editor, *BUSINESS*, Whitefriars House, Tallis Street, London, E.C.4. To simplify your request you may refer to the items by number only.

•Manufacturers and distributors are invited to send complete information about their new products for inclusion in this feature.

gases in chemical manufacturing plant or storage spaces, and the inspection of cartons in a powder filling machine to reject those not properly filled. In all these methods of use, labour can be released for more important tasks.

9 HAND TRUCK FOR USE IN CRAMPED SPACES

Intensification of national war effort has frequently resulted in installation of new machinery in previously clear spaces. Cramped alleyways through plant hinder internal transport, but a new hand-truck



This hand-truck, with large lifting platform, can easily be negotiated around sharp corners

has just been designed especially to negotiate sharp corners and awkward factory layouts. Fitted with a large lifting platform, the truck can be used with ease by either men or women.

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S.2 British Standard Fine (B.S.F.) Screw Threads—B.S.F. Bolts, Set Screws, Studs, Ordinary Nuts, Lock Nuts, Slotted Nuts, Castle Nuts, Washers, Split Pins and Tap Drill Diameters. 1,197 Values, Dimensions, etc.

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S.4 Dimensions and Principal Tolerances of British Association (B.A.) Screw Threads, B.A. Screw Heads, Nuts and Bolts. 1,555 Values, Dimensions, etc.

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M.1 Trigonometrical Functions. Natural values of Sine, Cosine, Tangent and Cotangent from 0° to 90° increasing by 10'. 2,184 Values.

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A variety of causes contribute to this. Awkward bends in alleyways—not unknown in the best of factories now that every possible square inch of floor space must be used for production—and extensions to old buildings not foreseen when conveyor lay-out was planned, are two of these.

Trucking Systems For Women Come Into Their Own

Man-handling was not a problem in pre-war days, when husky labourers could be had for the asking in practically every corner of the country. To-day, however, with nearly every able-bodied labourer in one of the fighting services, jobs for husky men must be done some other way.

That is why the trucking systems that a woman can handle are coming into their own. The first consideration is of course,

will a hand truck do the job. Often the ordinary platform truck is useless and uneconomical, since it involves two handlings of the goods on every journey. With large packages or sacks stacked at floor level, however, which must be handled as units whatever form of transport is employed, the platform truck is ideal—provided the woman labourer is not strained by the task of loading and unloading.

One of the simplest methods of overcoming all awkward internal transport jobs is to use a miniature truck-tractor which can lift one end of wheeled stillages and move them without great effort on the part of the labourer.

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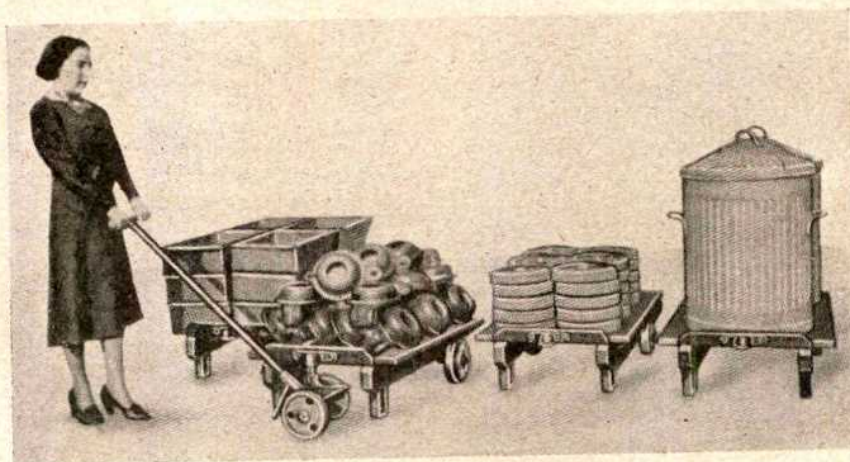
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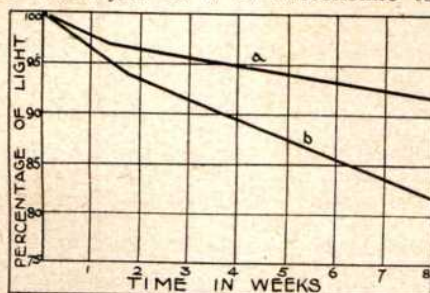
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LIGHT IS WHAT THE BULB IS GIVING YOU

(Continued from page 18)

taining the efficiency of your lighting is by means of a regular cleaning schedule which should be so arranged that the cost of cleaning is balanced against the economic wastage due to light depreciation. It is obviously impracticable to wash all fittings once a week, just as it is uneconomic to



The curves show the approximate depreciation in light output due to accumulated dirt and dust of
(a) standard dispersive reflectors,
(b) enclosing unit

allow a depreciation of light output up to 50 per cent. by not cleaning them at all.

Walls, Ceilings, Paintwork Can All Effect Your Lighting

Light measurements have indicated that a cleaning routine repeated every 4 to 6 weeks is usually most effective. Why not work out your own schedule? Read the illumination periodically and watch the depreciation.

Don't neglect walls and ceilings. They are important factors in maintaining good lighting conditions. A good index as to the need for washing down or re-decorating them is obtained by testing their reflection factors by a lightmeter.

In addition to checking the lighting on the working plane and testing quality of fittings, measure the lighting at floor level to be sure that it is enough to enable obstacles and refuse collections to be seen easily. A lightmeter need never be idle. No other instrument so well repays its first cost in continuous and useful service.

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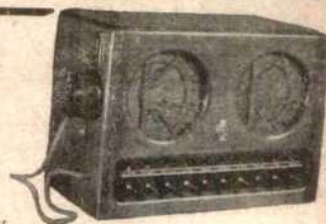
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LEDGER POSTING GIVES SIMULTANEOUS COSTS ANALYSIS

(Continued from page 20)

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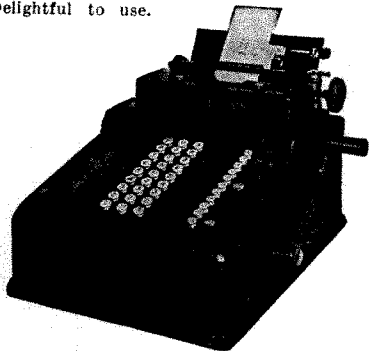
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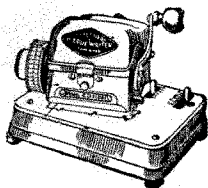
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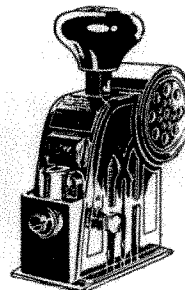


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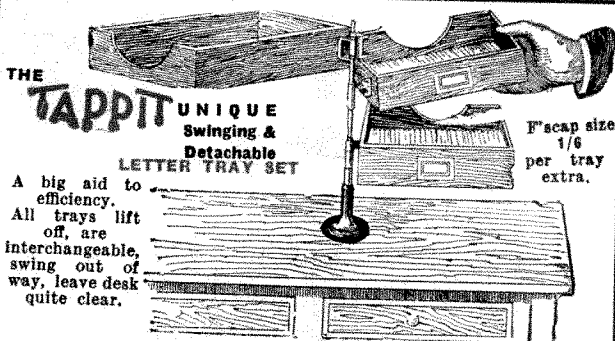
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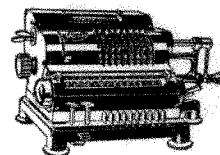
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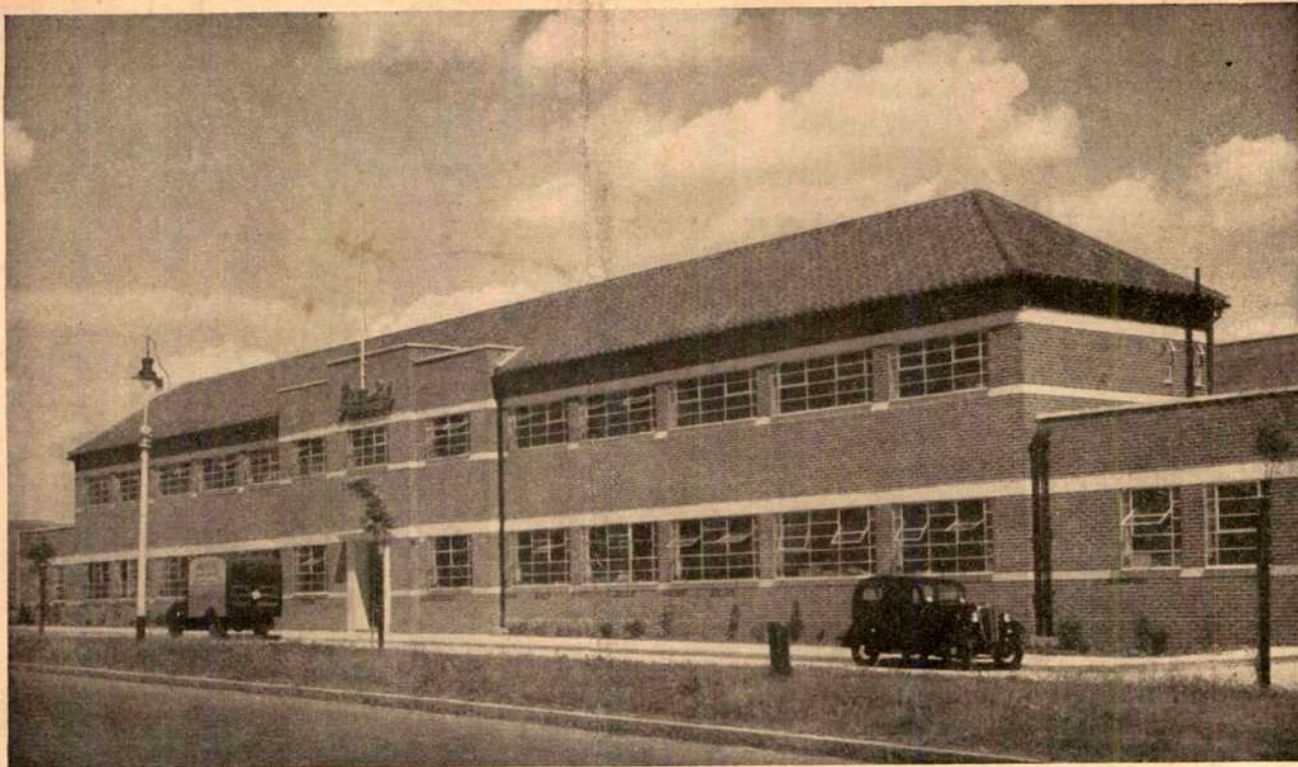


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Gravity Ladders greatly regret the delay in the delivery of their ladders, but arrears are being caught up, and we are booking orders for earlier execution where they are for A.R.P. and similar work, in which case authority symbols greatly help.

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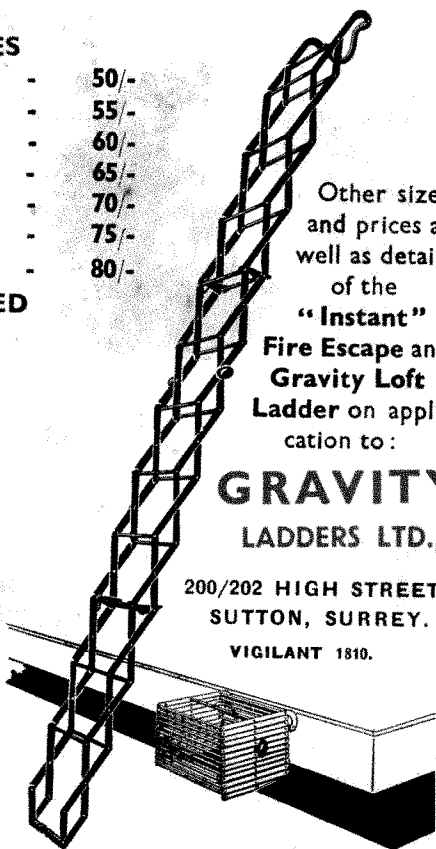
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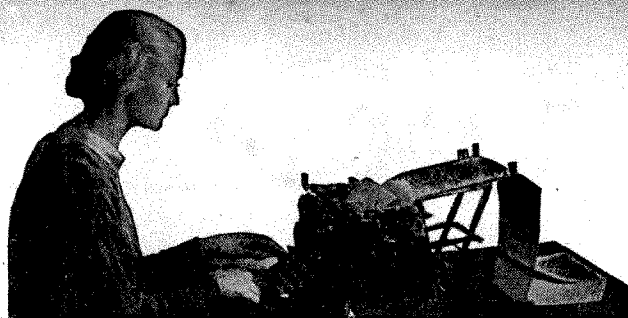
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The
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ALL STEEL - ALL BRITISH



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Your typewriter actually does the work of two machines when used with "Fanfold" Continuous Form Adapter, because the many time and money-saving methods of the Continuous Form Billing Machine are added to all the advantages of regular typing.

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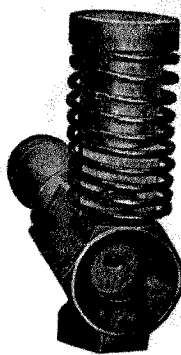


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Write for details of this and the WOODHOUSE INCENDIARY BOMB CONTROLLER, also of FIRST-AID HAVERSACKS AND POUCHES.



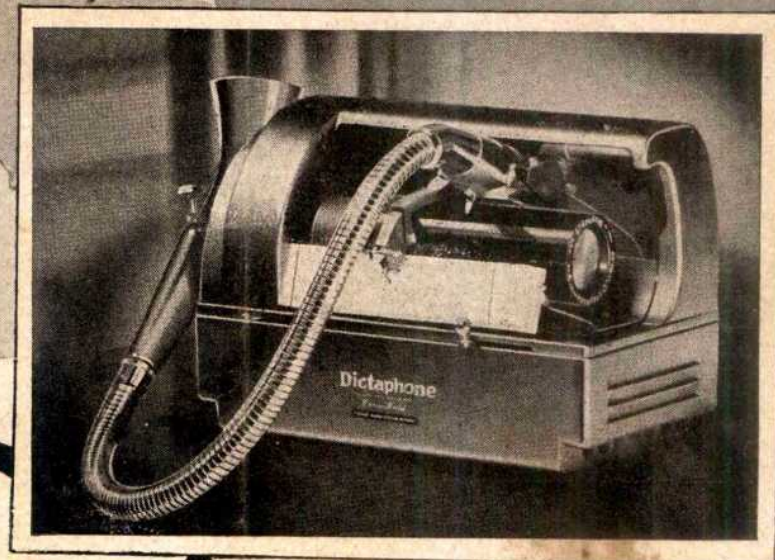
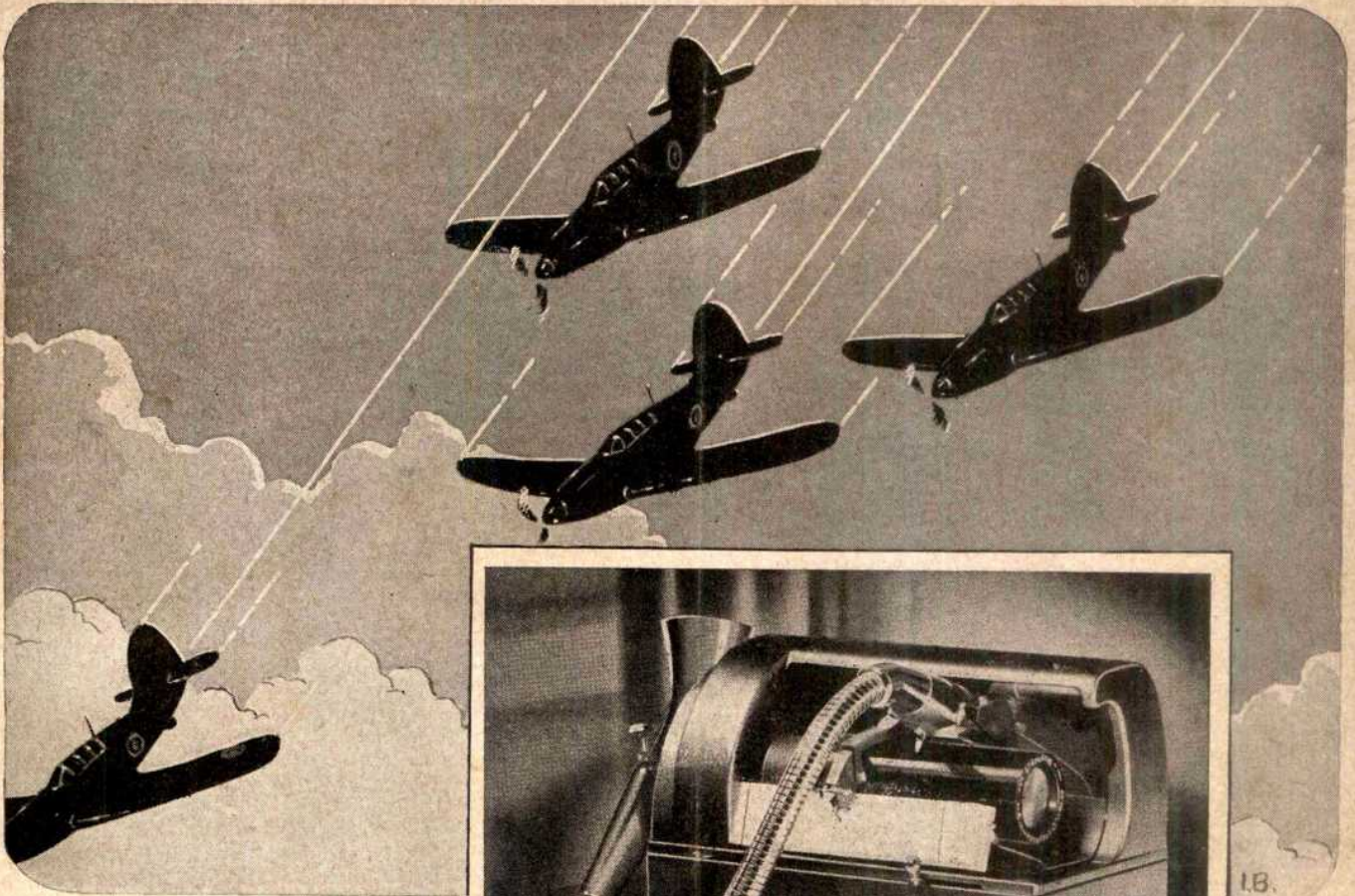
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Did you know that your typing staff
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at the same cost, and with
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AND PRODUCTION**

Incorporating "The Magazine of Commerce," "Modern Business,"
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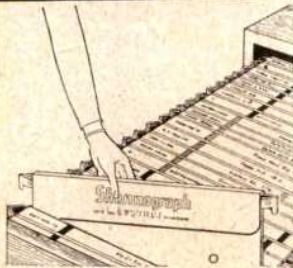
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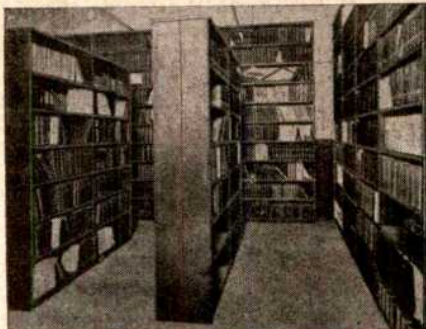


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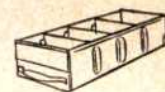
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AND BIN FRONTS



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USE WITH
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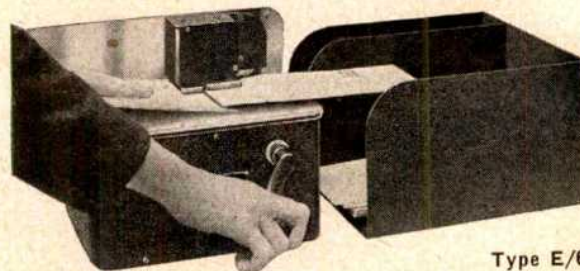
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"EFFECTIVE CONTROL" MEANS THAT—

Labour, Materials and Machines are utilised to the fullest possible advantage, that operation follows operation with regularity and precision, that waste in time and material is a known factor constantly under review. It means economic purchasing, controlled stock, balanced production, scheduled progress, planned maintenance, speedy, accurate costing.

AND ABOVE ALL IT MEANS simplification of routine so that all essential data is promptly recorded, correctly interpreted, and effectively used.

Your Index to BUSINESS EQUIPMENT, SERVICES AND SUPPLIES which can be obtained through the Announcements in the Advertisement Pages in this Issue

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mean

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Consult

COPE-CHAT SPECIALISE in devising methods for co-ordination and control. These methods are widely used and have been proved for their simplicity, effectiveness and low cost. They provide insight instead of oversight.

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INCREASED PRODUCTION

THE COPELAND CHATTERSON CO. LTD. Exchange House, Old Change, London EC4



SKILLED MEN ARE NEEDED FOR THE REALLY SKILLED JOBS

"Be sure that each of your men is employed up to the very limit of his skill. Combat skilled labour shortage by breaking down processes wherever you can, and by training up your workpeople, both men and women, to jobs of greater skill."

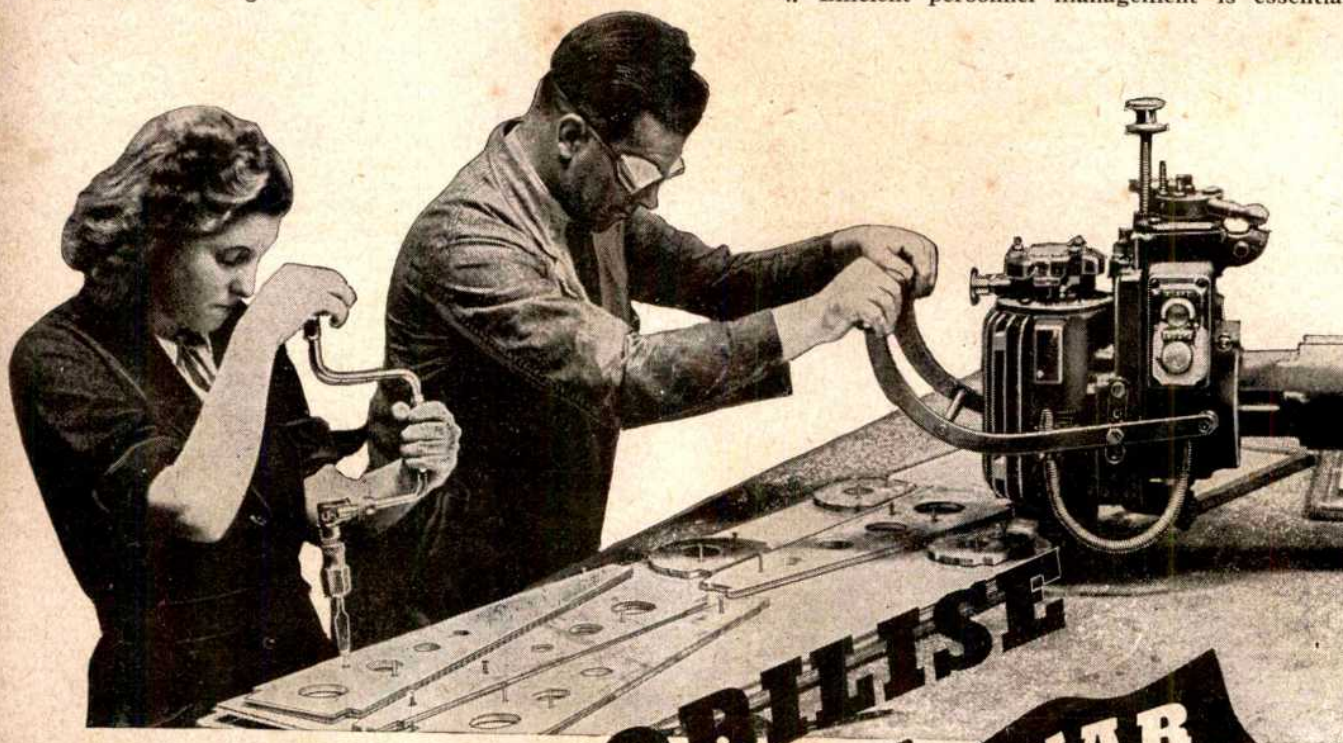
ANY ADVICE OR ASSISTANCE YOU MAY NEED IN THIS IMPORTANT MATTER WILL BE GLADLY GIVEN ON REQUEST

If you have any problem of this nature on which you feel you would like advice, remember that the Labour Supply Inspectors of the Ministry of Labour and National Service are ready and anxious to assist you. Do not hesitate to call them in. You can reach them through the Manager of your Local Employment Exchange.

The above is Point No. 1 of the Ministry of Labour's "4-POINT PLAN TO INCREASE WAR PRODUCTION" addressed to Management.

THE OTHER 3 POINTS IN THE PLAN ARE

2. Training Schemes must be developed to the greatest possible extent.
3. Prepare, now, to employ more and more women.
4. Efficient personnel management is essential.



REMEMBER ! If you have not yet received your copy of the "EMPLOYMENT OF WOMEN . . . SUGGESTIONS TO EMPLOYERS" instruct your secretary to write for one to-day (asking for pamphlet 87/1941) to the Manager of the Nearest Office of the Ministry of Labour and National Service.

**MOBILISE
FOR** 



These Plans will Help You Keep Trade-Marks & Goodwill

You Can Preserve Your Individuality although Your Business has been "Telescoped"

says

G. J. FRESHWATER,

Advertising Controller, Electrical & Musical Industries Ltd.

**in an interview with a
BUSINESS Investigator**

THE preservation of trade-marks and goodwill is the first duty every manufacturer owes to himself and to the country. The handicaps which at first seem insuperable when concentration—either voluntary or compulsory—is forced upon an industry can easily be overcome if the firms who are "telescoped" together decide to adopt a mutually helpful working plan.

Concentration is no new thing to industry. But in pre-war days, it disguised itself under the title of amalgamation or, for a few years, rationalisation. One of the biggest concentrations of recent years and certainly one of the most successful was that which resulted in the formation of Electrical and Musical Industries, Ltd.

It is possible to retain Individual Identity

To most people the constituent companies of this group are still independent concerns. Often to the potential purchaser of a radio set it would appear that H.M.V. and Marconiphone are two of the bitterest competitors. It is the same with gramophone records.

If it is possible to achieve this result—the most desirable one from the viewpoint of a manufacturer who may have many years of successful trading behind him—how was it accomplished?

So far as the average manufacturer is concerned the main problem is that of marketing. Questions relating to manufacture, purchasing and accounts can only be solved when the exact con-

ditions in each concentrated group have been closely studied. But the principles of marketing are broadly much the same right throughout industry.

BUSINESS realised this and we decided to ask Mr. G. J. Freshwater, advertising controller of Electrical and Musical Industries Ltd., to tell us how E.M.I. were able to achieve complete financial and manufacturing concentration yet continue to sell each product of the companies in competition with one another.

MR. FRESHWATER'S VIEWS ON CONCENTRATION

E.M.I. had this one great advantage over the manufacturers who are being forced willy-nilly into concentration. The company was able to study each and every problem carefully in advance and to prepare detailed plans which would prove to be the most effective in action. Everything that could be foreseen was carefully calculated.

But what E.M.I. learned by experience and careful planning you can do with almost complete certainty of success.

A glance at the chart on page 8 will show you the structure of the manage-



A round-table conference of sales executives can produce a marketing scheme which will allow each trade mark an uncompetitive field

ment of the company. This naturally shows many of the features which must be ignored for the purpose of this article—factory, purchasing and accounts—but they have been left in to show their relationship to the other departments whose activities we have to consider.

Starting with the managing director, who naturally controls the whole organisation, we find he has five assistants, joint general managers, who are respectively responsible for the five main divisions of the company, factory, purchasing, accounts, sales and export.

Each of these joint general managers is assisted by a number of "controllers," who are responsible for departments in each section. Each controller deals with the problem of his respective task for the group as a whole, being assisted by managers who are responsible for the work of the individual products. Thus, to take the sales department: The joint general manager in charge of sales is assisted by five controllers, respectively responsible for radio, domestic appliances, records, cycles and advertising. The controller of radio is assisted by two sales managers, one each for H.M.V. and Marconiphone. Similarly, the controller of records has

three sales managers under him, for H.M.V., Columbia and Parlophone, while I, as advertising controller, have six advertising managers to assist me.

With this structure it is possible for controllers to review their work as a whole and to co-ordinate the activities of the various managers who assist them. Each sales or advertising manager knows the various problems of his own field and he is able to thrash them out with his controller and the other managers, often handling competing lines.

Plans can be Made to Avoid Brands Clashing

It would not be difficult to apply this principle to any concentrated industry. A council of sales managers in the group could work out the exact field that each product was to cater for. Where two products were in competition a plan of campaign could be prepared to decide just how each was to be marketed so as to avoid too great a clash between the lines.

Here again the experience of the E.M.I. group will prove of great value. When the group was first formed, H.M.V. radio and Marconiphone sets were designed to cater for approximately the same market.

To-day, with greatly reduced output owing to war conditions, it would be unfair to consider the two companies as competing at all. So great is the scarcity of radio sets that they are purchased almost before they are off the production lines.

Keep One or Two Branded Lines Before the Public

But the plans for the future, prepared as the result of several years' trading before the outbreak of war, are for the two companies to produce radio sets which will cover the whole field of demand but in which the sets will not be sold in competition with each other except for the narrow band in which their two fields join and slightly overlap.

The "telescoped" manufacturers can

adopt this future E.M.I. plan to-day. Provided the trade-mark or brand-name is kept before the public on a few popular lines, there is no reason why each company should not temporarily relinquish a part of its whole field to another firm in the same group. Assuming this was worked out on a basis that would enable each manufacturer to retain a fair share of the total



Mr. G. J. Freshwater, Advertising Controller, E.M.I., who offers you valuable advice on the preservation of trade marks and goodwill

output and sales proportionate to his pre-war figures, no one within the group would have cause for complaint.

Concentration has been introduced to save wasteful output and to reduce man power in non-essential factories. Reduction of the number of lines produced will go far to achieve this.

Sales Representatives Can Handle Several Competing Lines

When it comes to actual selling, too, I think I am able to offer some suggestions which should prove of value.

In pre-war days each product of the E.M.I. group was dealt with by separate staffs of sales representatives. This would sometimes mean that two salesmen from the group would meet at a customer's shop or office and, to all intents, be treated as competitors, as indeed they were.

Reduction in output, coupled with the need for reducing man power to the minimum has now resulted in a representative of each section of the group covering his area for all the products in his section. Thus a salesman in the record field now calls on

customers not as the representative of H.M.V. or Columbia or Parlophone but of all three companies. Here again the policy of specialisation—of making the various units as non-competitive as possible—has proved of immense value.

This same idea can be adapted to the sales staff of a group of companies that have been compelled to telescope their interests. Provided the salesman has a firm grasp of the sales arguments of all the lines he has to talk about, he will be able to fulfill the main purpose of concentration without loss of business. The fact that he will be able to present a really comprehensive sales-story, embracing a number of different trade names, should help him to a considerable extent in securing an order.

There is, of course, the problem of what to do when shortage of supplies prevent even a concentrated group from filling all the orders they receive.

Here my own wide experience in advertising may be of help to you.

The E.M.I. group are carrying out to a very large extent the policy that I recommend to every manufacturer who finds he is likely to lose immediate contact with his customers of pre-war years.

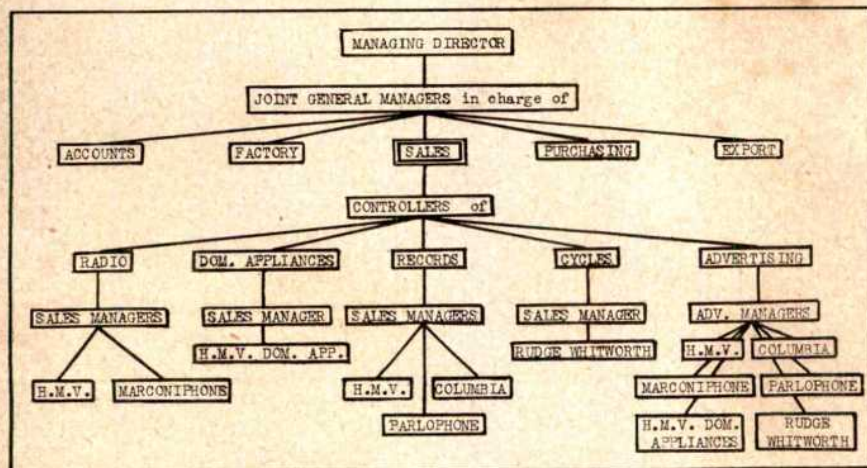
Goodwill publicity is a subject on which much has been written, but when seasoned advertising men come out wholeheartedly in favour of it, as many have done, it is obvious that the critics, whose main argument is that you cannot show any tangible results from such advertising, are standing on very weak ground.

Millions Are At Stake in Trade-marks

Goodwill publicity, should be carried on to the utmost limits of a manufacturer's financial resources. Only the individual manufacturer will know just which were his best customers, the main sources of his revenue. To these he should address his apologia for inability to supply his usual products at the present time. Whether this is done through the trade press, daily newspapers or class magazines, or through the medium of news-letters (an idea that many firms are employing with success) is again a matter that only the individual can decide.

But goodwill and all it means must be kept alive and advertising is the only way to do it. Millions of pounds have been spent in building up the brand-names and trade-marks which must necessarily be discontinued to help the national war effort. But millions more would have to be spent, where a few thousands would suffice now, if the buyers of former years were allowed to forget the existence of the firms who have been the backbone of Britain's trade at home and abroad in happier times.

All that is needed is for firms, who have to pool their resources for the period of the war, to make a joint effort for their mutual self-preservation to be able to fight in the trade war which will follow.



The structure of the sales organisation of Electrical and Musical Industries in relation of the other principal sections of the group. Each individual company in each section is under the supervision of a controller who co-ordinates their individual marketing and advertising efforts

One of these women was a checker in a bakery two months ago, the other worked for a firm of dyers and cleaners. Both are now experts at their jobs at the bench of this motor works owing to the speedy and efficient methods of training



We Train Women for Factory Bench Work in Fourteen Days

AT the beginning of this year it became imperative that we should employ women workers on many of the jobs previously done by men.

The great problem was how to train them for the special type of work they would have to perform in our factory. Many of the girls, it was realised, would be of the type that had never known factory life before. Probably they would be shop girls or come from offices. Certainly they would need a complete training, but how long this would take could only be determined by actual experiment.

Fortunately, we have, attached to our main factory, a large service depot and it was decided that, as many of the girls would be employed on service jobs, to convert a part of this into the training school. Training, it was decided, would be conducted in the same manner as work in the factory, except, of course, that the tempo would be slower.

They Were Strangers to Grease and Oil-Stained Hands

Then the girls started to arrive. They came, as was expected, from offices, shops and homes. All were volunteers. Only those who had transferred from non-essential to essential industry had previous experience of factory life. The majority had never seen a work-bench before; to them grease and oil-stained hands were something new.

Contrary to some expressions of opinion they were not wholly attracted by the prospect of high wages. Quite a few had thrown up good positions and made definite financial sacrifices for the privilege of working at benches and machines.

As any conversation with them will reveal, they have one common desire

Tuition under Actual Factory Conditions but at Slower Tempo Speeds up Transfer of Learners from School to Workshop

By an Executive of a Leading Motor Vehicle Manufacturing Company

—either to help actively in munition making or to keep the wheels turning on the Home Front. The type of job doesn't really matter so long as it contributes in one way or another to the war effort.

Each one replaces some man for work of even more urgent importance or releases another for service with the Forces.

Some have now been at work with us for several months, others are still going through their period of training.

Applicants for employment in the factory come through three sources: the Labour Exchange, Government training centres and introductions from present employees. In all instances they are interviewed at the Labour Exchange, issued with an introduction card and apply at the factory labour office where they complete an application form. They are next interviewed by our labour superintendent, who has a personal talk with each applicant.

Preliminary Questions Reveal Suitability for Various Jobs

Their previous occupation, smartness, intelligence and aptitude for work are noted, and where a prospective employee has previously been engaged in factory work, particular note is taken in order to make sure that the work upon which she will be engaged in our factory will, if possible, follow on her previous experience.

The terms of employment are clearly explained, and the hours which employees will be expected to work in a normal week, with overtime, and the question of night-work are all thoroughly defined. This obviates any later query or complaint about periods of work.

In the case of married women, the labour superintendent already has information on the application form as to the number of children and occupation of the husband, and from this he is able to tell whether there are any family ties which would prevent such women from working at night.

Full Advice on Work and Clothing Is Given to Newcomers

The women are selected in the first place for a particular job for which there is an existing need for labour and for which they may seem to have a certain aptitude. Generally speaking they remain on this work unless they prove unsatisfactory. In such cases every endeavour is made to transfer them to some other part of the factory with a view to making them useful elsewhere.

After her interview with the labour superintendent each woman is seen by the welfare superintendent who advises her on the type of clothing to be worn, overalls, and the way her hair must be protected to meet safety requirements. At this interview—



From the counter of a West End confectioners to skilled work at a bench in fourteen days!

which is in the nature of a friendly chat designed to put the new employee at her ease—information is obtained, if she possesses children, as to how they will be taken care of when she is working at night.

After several months' operation of this scheme to use women workers, statistics show that about 40 per cent. of the women now at work have been previously employed in factory work of some kind or other. But that does not mean they do not have to be re-trained to perform the type of work they are now called upon to do.

The percentage of women who have asked to leave is very low, and there is only one case on record where a girl has given up her work because it did not turn out as she expected.

Training is so Simple that it fits into Ordinary Routine

No new methods have had to be adopted by the planning department and it has not been found necessary to amend the normal production schedule or operations because of this intake of female labour.

The work on which women are engaged naturally varies and the methods of training differ according to the particular job on which they are to be employed.

For instance, a girl on a drilling operation, after introduction to her foreman, is passed over to a setter, who then takes her along to a drilling machine which he explains in detail. He also explains the job and then actually does two or three of the operations on the part on which the girl is to work. After watching this, the girl is asked to try her hand and, with the guidance of the setter, she completes the operations on her first part.

She then carries on to the second one, and this, when completed is taken

to the viewer for inspection. If found satisfactory it is handed back to the new operator, who retains the part for comparison with all future parts, so that all, when finished, should be identical. If there is any variation the charge-hand is notified at once. **By this means, within a matter of two hours the girl is actually on production work.**

In the case of a capstan operator the training period is longer. The girl first of all spends a few hours with a setter under whom she will work, and has all the intricate mechanism explained to her.

Women are Not Allowed to do Heavy Lifting

In most cases, the new operator works with an experienced girl for approximately two weeks and towards the end of this period she is allowed to handle the machine before commencing on her own machine the following week. She does not do any setting up herself and the whole time she is under the guidance of an experienced setter, who has approximately six girl trainees to look after.

During the whole of the training period the girls are under the supervision of skilled and experienced operatives, and every care is taken to see that the high standards of workmanship demanded in the service station are fully maintained.

Lifting of heavy parts is always done by the men, who, from the first have shown themselves ready to give the newcomers whole-hearted assistance. Each works amicably with the other and there is an excellent spirit in the shops.

Every Worker Gets One Clear Day Off In Seven

Among the tasks now allotted to women are the cleaning, lapping and re-assembling of injectors in the pump room. Others are engaged in the stripping down and cleaning of fuel pumps ready for assembling and testing by experienced mechanics.

In the shops one group is employed in reconditioning cylinder heads, which covers such operations as cleaning valve guides, cleaning and regrinding valves. Another group works on the assembly of connecting rods and fitting rings to pistons in readiness for broaching and alignment operations to complete sub-assembly units. A third is engaged in the re-conditioning of oil and water pumps; a fourth in studding timing case covers.

In the stores most of the service counter work is now undertaken by women. These women employed in the stores have proved as accurate and as quick as men. But, of course, the demands of the motor industry make it impossible for them entirely to replace men because of the weight of materials to be moved.

The hours of work for women employees during their first two weeks are from 8 a.m. to 5.30 p.m. During this time they have an interval for lunch

from 12.30 p.m. until 1.30 p.m. After the first two weeks they are expected to work overtime from Monday to Thursday until 7 p.m., and are given a ¼ hour break for tea from 5.30 to 5.45 p.m. On Friday evening they leave off at 5.30 p.m.

If they are working on Saturday from 8 a.m. to 5 p.m., they have Sunday free. Alternatively, when they work on Sunday they have the whole of Saturday free. Thus their working week is six days, giving them one complete day's rest in every seven.

Women are employed on day shifts for two weeks and then on night shifts for a similar period. The night shift lasts from 7 p.m. until 6 a.m. and during this time they have a break from 10 until 11 p.m. for supper, and a further break from 2 until 2.30 p.m. Whilst on night-work they are under the control of a special welfare supervisor.

How the Company Tries to Cure Absenteeism

Absenteeism is, of course, not unknown, but it is on a comparative small scale, and works out at a little less than 5 per cent. Endeavours towards prevention are made by arranging for the welfare supervisor to interview each girl after she has been absent, and the supervisor, after enquiring into the reason, reports to the labour superintendent on each individual case.

The company endeavours to meet the women whose husbands return from the Forces on leave by granting them a period of seven days' holiday. In addition, of course, we conform wherever possible with the wishes of the Government as set out in their leaflet issued in March, 1941, on the employment of women labour.

Government Trainees are Surprised at Speed of Factory Work

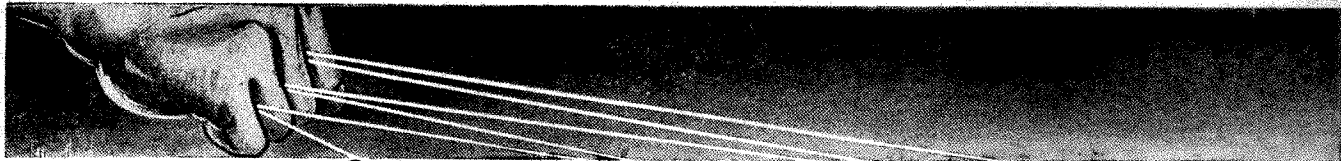
It may be interesting to know that the women who come to us from Government training centres are usually surprised by the speed at which the factory works as compared with the rate at their training centre. All these girls, of course, are submitted to a further training when they come to us.

A large number of women apply for work at the factory. There are, in fact, many more applicants than vacancies and in consequence we are able to exercise great care in our selection of labour. No compulsory workers are employed in the factory. For our particular work we have found women between the ages of 20 and 30 are the most suitable.

How would they prove themselves in jobs formerly done by men? When the first women arrived for training that was the question asked by many officials of the company. The answer has now been found, and it is: "They are doing very well!"

As for the women themselves they all agree that they have found their new tasks surprisingly interesting.

Management in War-time . . .



MANAGEMENT

CONTROL

POLICY

The New Approach to Labour Problems

SOMETHING like an entirely new approach to labour problems is evident in the United States. Eight years of democratic government have opened the eyes of most managements to the failure of pure time study and speeding up to get satisfactory results. With even Ford's running a closed Union shop, the need for more human management has become acute.

Extremely interesting work has been done in actually studying at close range the effects of improving (and worsening) factory conditions. The main conclusion is that it isn't hours, pace, comfort or cossetting that counts so much as making every employee feel that he or she is *important* as an individual worker.

This is something that the owners and managers of small shops have always known: but the application of the idea to a large business is more difficult. We shall publish some of the most important discoveries in this new phase of management policy both here and in the United States in our autumn issues.

Teaching Salesmen to Sell

THERE are more problems that face many firms with sales staff, necessarily only partially employed at the present time, than those discussed in this feature last month. The managing director of a big motor engineering company—the bulk of whose output goes for war purposes these days—told me of another evil that he has to meet.

With a much reduced output available to ordinary peace-time customers, he has found that his salesmen are adopting the attitude of doing anything to keep the customers "sweet." "Some years ago," he explained, "we revamped our methods of selling because it put too much emphasis on *getting* and not enough on *giving*." This is certainly a good point, but, as he said, it can be carried too far. Sometimes the salesman carries the giving to the point where he is giving away all the profits of the business. To-day a salesman will often arrange to let an easy customer of former days have far

more than a fair quota of to-day's output.

Serving a customer is one thing; but acting as his ambassador to get favoured consideration is quite another. Admittedly every company wants to preserve its pre-war field of customers in as happy a state as possible. But the salesman who "works for his customer" is practising one of the most abhorrent forms of low-pressure selling. In fact, it is lazy selling. A salesman who does this is really working against himself. He is bringing nearer the day when the profits of his efforts will not support him. And he is certainly making things difficult for himself when peace conditions come again.

Guarding Our War Factories

ANYONE who has to visit Britain's factories busy on work of vital national importance knows the multitude of different systems used to keep out unwanted callers. Some are most efficient, others, by their very involved technique, defeat their purpose and waste more time of both visitor and visited executive than the precautions are worth. Others, by their crudity, offer no safeguard at all. No effort, it would seem, has been made to work out some simple scheme that could effectively be used by every factory management throughout the country.

The United States, however, has called in its famed "G" men to provide the necessary guard against illegal visitors and would-be saboteurs. The Federal Bureau of Investigation's most important job now is protecting production. The President's Budget included a £300,000,000 item for anti-sabotage activities.

The men of the F.B.I. are visiting factories turning out vital defence goods in the order of their priority of importance, looking over the methods used to identify workers and visitors and to explain to executives the best ways to check up on prospective employees' international sympathies without infringing rights of privacy.

The control recommended is exacting. For example, at any factory that the F.B.I. men have visited you now enter a small reception room, policed by a uniformed guard. The receptionist asks your name, your business, your

home residence address, and calls the person you want to see on the house telephone. Then another guard escorts you to the person's office.

After your business is completed, the person you have been talking to is required to accompany you to the reception room and personally check you out of the building. You notice every employee wears a special numbered badge which has the worker's picture in plain sight on it. F.B.I. men going through the plant look at the employee's face, glance at the photograph on the badge. If they don't synchronise, something is wrong, and the F.B.I. man finds out immediately what it is.

Procedures like this didn't evolve overnight. They were studied and worked out with considerable care.

Fortunately, in Britain, we do not seem to have quite the same risks of sabotage as exist in the U.S. But a standardised plan of checking visitors would mean a vast improvement to many of the systems in vogue to-day.

Post-War Planning is Beginning

MORE post-war planning is being done behind the scenes than many directors realise. Not satisfied with its International Wool Secretariat, the wool industry now has a National War-Textile Export Corporation functioning. Some of its attention is devoted to post-war market surveying, sales method study, and design.

One or two of the most far-sighted of the advertising agents are planning far ahead for their clients, particularly in overseas markets. In particular German and Japanese methods of selling direct through salesman and propaganda paid for and controlled by the manufacturer are ruining special study. It is difficult for many of the smaller industries to organise displays of foreign competitors' samples: but in some cases co-operation among a few houses can achieve a surprisingly helpful show.

We hear a good deal about sales managers with their feet on the desk: this examination of export markets is a job any sales manager can tackle with the assistance of an advertising agent experienced in the areas concerned.

Make the New Employee Feel at Home AT ONCE

THE three words that are among the most costly ever used in industry are those that make up the erring employee's plea: "Nobody told me."

These are heard whenever someone makes a mistake, forgets some important task, is hurt, or otherwise causes trouble or gets in a jam.

It is quite unnecessary to cite any examples of trouble that could have been avoided if employees had been properly and fully instructed about their duties and responsibilities, about company policy and activities. Thousands of them occur every week throughout British industry. And most of them, no matter how we may deplore it, could have been avoided if it had been somebody's business to instruct and guide a new employee and if that beginner had had details of what was expected of him in black and white.

Works Manuals are Needed by Firms of all Sizes

It has been in an effort to provide employees, new and old, with accurate, simple understandable information, that many companies have produced so-called manuals or hand-books for their staffs. These have done much toward eradicating the "Nobody told me" excuse. If, after reading his works' manual, the employee remains uninformed, it is his own fault.

Probably every company with more than two dozen employees needs some sort of handbook, printed or duplicated. Too often we think of such devices as something useful only for large companies where the number of workers runs into thousands. But it is common sense to remember that in any company where executives are not in constant, easy and informal contact with all employees, a works manual is needed.

Put the Soft Pedal on Mandatory Rules

Unfortunately, a number of firms who have realised the importance of such a handbook have concentrated on informing the employee what he could *not* do and what he *must* do. These must have made the new employee feel as if he has just been sentenced to some type of voluntary servitude and denied all the freedom and pleasures of life. Happily, the newer type of employee manual puts a soft pedal on harsh rules and mandatory regulations.

Compare, for example, the mention of smoking in the staff manual of a well-known store with that of another

firm: "In view of the large amount of merchandise and equipment concentrated in the building and the huge loss and consequent unemployment which might be sustained in case of fire," says the stores' manual, "you will realise how very important it is to observe strictly the no-smoking rule."

Don't Make the Job Seem like Gaol

Surely this would impress any employee as a fair and reasonable request. In the other manual we find only this abrupt statement, "Smoking anywhere in the factory area is strictly prohibited. Violations will lead to immediate dismissal."

Two other cases may also be cited. Both appear in the manuals of somewhat similar manufacturing firms. Both firms have their factories at some distance from the nearest town and transport arrangements leave much to be desired. In the first case, at the present time the average shift time is about ten hours a day. Employees of this firm are advised immediately to notify the management of any transport difficulties, and frequently the firm's own vehicles have been hastily pressed into service to ease the position when, for some unknown reasons, the supply of omnibuses is inadequate.

In the second case, the factory is even more awkwardly situated. It has

Getting Off on the Right Foot

Finding that war conditions imposed an enormous number of changes, a famous motor manufacturing concern has abolished its "Works Rules and Regulations." In place of receiving this book, every new worker has all the conditions and privileges attached to his job verbally explained to him.

As changes have to be made, the managing director makes it his job to tell all employees about them. All important alterations are embodied in small pamphlets which are circulated to all in the works.

In addition, a special welfare supervisor and ten floor supervisors have been introduced to help the management keep in touch with the workers.

How to take the Mystery Out of the New Job

been known for workers, leaving after a twelve-hour shift, to be compelled to wait over half-an-hour for some form of transport. Yet this firm has the following paragraph in its manual: "Employees making signs or waiting with the object of attracting drivers of vehicles between—and—(two points about a quarter of a mile on each side of the factory) will be subject to dismissal." The management makes the following generous(?) easing of the restriction: "Exception to the above, where the driver is known to the employee and stops by arrangement."

No wonder some employee handbooks make the new job seem like a gaol, while others make the new worker think he has the best job in town.

What does the New Worker Want to Know?

It is naturally impossible to list all the various items on which advice and guidance may be given to a new employee. The list is long and there are many variations determined by the type of business, its location and the number of workers employed. To understand fully how much a handbook should tell we have only to ask ourselves what we would want to know about a new job if we were beginning our careers over again.

Perhaps we would like to know when and how we were paid. If by piece-work, or on some bonus plan, just how is our pay calculated? This is an important piece of information which many companies neglect to explain. Each pay day brings a question and perhaps a doubt to some employee's mind.

Tell Them all About the Welfare Side

What else would we want to know about our job? Well, that isn't so hard to decide. What are the hours? What days are observed as holidays? Do we get paid for holidays? How long do we have to work before we earn a holiday and how many days do we have then? What about absences because of our illnesses or for illness or death in the family? Can we borrow money in an emergency? May we use the telephone for personal calls? To whom should we report a grievance?

Is there a company savings plan? Insurance plan? Bonus plan? Pension plan?

But the job of making the new employee feel at home cannot end with a hard-and-fast handbook. This fact has been made abundantly clear by the experience of many of the best known manufacturing concerns in the country.

Easily one of the leaders in the job of making the employee feel as important as the product is the firm of Cadbury Bros. Ltd. The story of Bournville has been so well told as to require no reiteration here. But just how this indisputable reputation for having happy workers has been achieved needs a little amplification.

These Rule Books are Designed by the Workers Themselves

Cadburys have four "rule books," designed for men and women in offices and works respectively. These approximate very closely to the ideal for works manuals. These rules are not made by the firm but through the Rules and Discipline Committee of the Works Councils, composed of representatives of the employees and an equal number of management representatives.

The task of introducing the worker to the job does not end there. The bulk of new engagements are of juniors. These all pass through an initiation school at which they attend lectures and see films, etc., bearing on the factory, its history, processes, raw materials and institutions, safety and health measures, voluntary and compulsory educational facilities, etc.

The shop committees, an integral part of the Bournville Works Councils and, in the case of boys, the departmental representatives on the Youths' Committee, also help new employees over the first new months of their factory service.

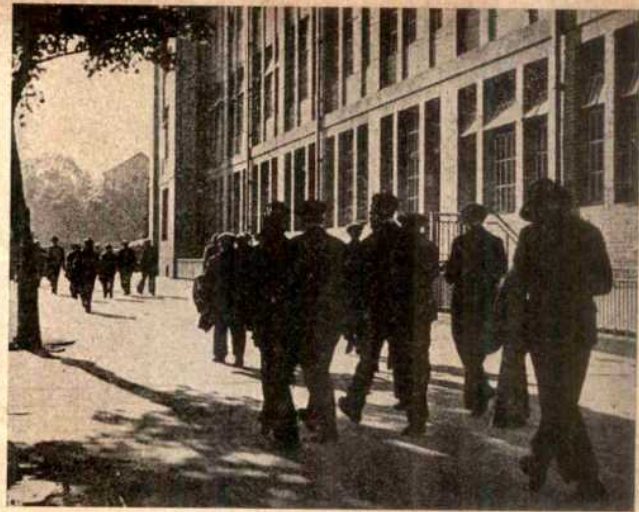
The Youths' Committee provides opportunities for the games, hobbies and handicrafts of all the young men in the factory and office, as well as giving them ample scope for amateur dramatic work and holiday planning. The girls have somewhat similar facilities. The result — the happy factory.

The New Workers Here See the Whole Works

No less definite in their task of making the new employee feel as one of a big family are Lever Bros. & Unilever Ltd. Every new member of the staff is seen by a senior manager on arrival. This interview is followed by a tour of the offices, canteen and welfare department before the actual introduction of their new job begins. Everything that can be done to make the new workers feel at home in their strange surroundings is undertaken.

A similar system is adopted by Boxfoldia Ltd. of Birmingham. Every employee on commencing is given a booklet describing conditions of employment, so that he or she is aware of

How many of your workers would plead "Nobody told me," if anything went wrong? A simple handbook will make every employee feel at home at his job



the type of works into which they have come. The firm knows, however, that any booklet cannot cover the problem. A booklet certainly can give a newcomer a theoretical view of the firm but the personal contact is considered to be the only one that can make the employee feel really at home and a part of the organisation.

Every new employee is, therefore, welcomed by an officer of the employment department and is shown the various facilities and is later taken on a tour of the works, so that a complete idea of its layout and a fair idea of the product is obtained.

These Ideas Help the Worker to Settle down Quickly

During the second day the works engineer gives a short talk on safety. Throughout these initial proceedings the newcomer is constantly reminded that the management is always willing to help both in connection with problems connected with the factory and with any difficulties that may be experienced in other directions. The ramifications of the Charles Henry Foyle Trust, which is designed to help workers in their life outside the Boxfoldia factory, are fully explained and the initiation of a new worker by these means does much to break the ice and help him or her to settle down much more quickly than would otherwise be possible.

The management, however, recognises

that whatever it may do the employee is always reliant on his fellow workers. To help in this direction older men and women are always encouraged to look after new employees and make them feel at home. Long experience in this has resulted in a substantial number of old employees being recognised as the ideal companions for a new worker.

"Rules of the Game" make for Willing Co-operation

The works manuals and welcoming systems described briefly are a far cry from the terse list of "do's" and "don'ts" which formerly passed for employees' handbooks, and in a few instances are still in use.

It may take a little more time and thought to prepare a scheme which figuratively grasps the new employee by the hand in a friendly gesture of welcome, than one which merely shakes an admonishing finger in his face. But it costs no more to print warm friendly words than cold, commanding ones. The little extra time and thought required to think of tactfully phrased "rules of the game" are well repaid in the increased willingness and co-operation engendered among the staff.

Careful explanations of policy are not only of direct benefit to the new employee in getting off on the right foot, but they save the company untold sums every year in avoiding accidents and mistakes which might have happened if "Nobody told me."

THESE ARE THE QUESTIONS TO ANSWER WHEN YOU COMPILE A "WORKS MANUAL" . . .

What are the hours of work?

What are the rates of pay? bonus? piece work?

How long before an employee is entitled to a holiday?

Will it be a holiday with pay?

What has to be done when absent through illness?

What is the extent of welfare activities?

What are the health and safety regulations of the works?

What voluntary or compulsory educational facilities are there?

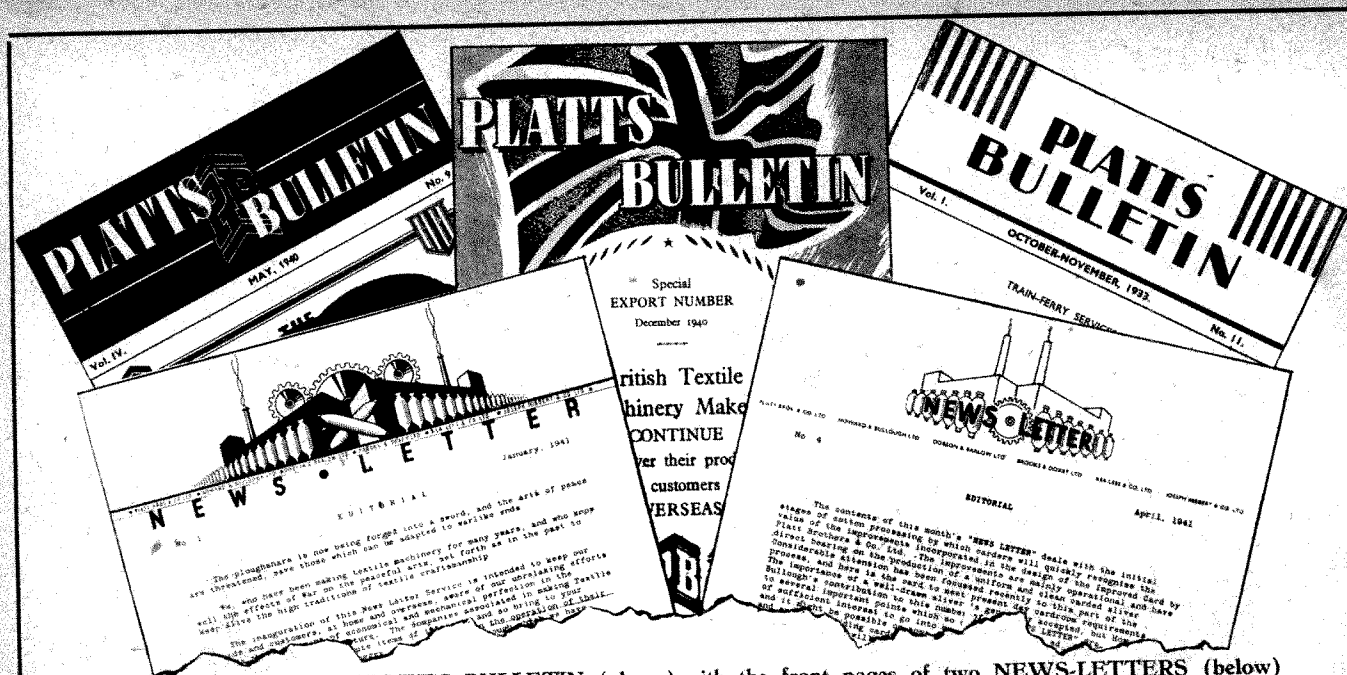
How does the Sports Club function?

What help will the company give in the case of urgent need for money?

Is there a savings plan?

and, of course,

What are the departmental rules of working?



Three typical covers of PLATT'S BULLETIN (above) with the front pages of two NEWS-LETTERS (below)

How to Keep Markets Alive at Home and Abroad

FREQUENTLY BUSINESS is asked for advice on the best war-time method to adopt to keep in touch with customers, both in Great Britain and overseas. Usually the enquiry comes from a firm that has had to turn practically the whole of its output over to a war basis.

In such cases, the problem is, of course, one of maintaining goodwill of pre-war customers and telling them of the plans that are being made to continue production of the firm's known products and branded goods when conditions again permit.

The answer to these appeals for advice is obviously the news-letter. Production costs of such a publication should be negligible. The actual writing should be undertaken by a skilled journalist or publicist—one well versed in the art of condensation of facts into their smallest compass. Presentation is equally important. Here again, this is a matter for the skilled artist, but none of these items need be costly.

Paper Shortage Compels House Organ to Stop

The news-letter is, of course, the modern development of the house organ, that popular medium of reaching customers with something much more personal and more chatty than a catalogue. House organs had many forms before the war, but not one published in Great Britain was looked forward to by members of the industry for which it catered with greater expectation than that published by Platt Bros. & Co. Ltd. This firm is, of course, one of the foremost firms of

A Big Engineering Group Proves Efficacy of News-Letters to Maintain Goodwill

engineers catering for the requirements of the textile industry.

Platt's Bulletin, as this house organ was called, was planned as a combination of news of the company's activities and a commentary on developments in the many types of machinery used in textile production.

The News-Letter Serves the Whole Group

But war-time conditions compelled the firm to cease publication of this journal. The shortage of paper was becoming so acute that a more economical method had to be adopted. So, in place of Platt's Bulletin appeared a news-letter.

Platt Bros. & Co. Ltd. have in recent months become the leading firm in a concentration of companies, all of whose activities centre around machinery for the textile industry. The importance of this group may be gathered from the fact that they are known collectively as "The Textile Machinery Makers." There are six of these companies in the group at the present time and the news-letter, which made its first appearance last January, serves as the joint publication of all firms in the combine. It is a four-page quarto sheet and contains on the average 2,500 words and two or three small illustrations.

Now that this unique news-letter has

more than six months successful publication behind it, BUSINESS selected it as one of the most useful publications of its kind to investigate.

The editors of this news-letter have every reason to be proud of their work. When they ceased publication of Platt's Bulletin, they expected a number of grouses from long-time readers. Fortunately, however, the news-letter was published before the non-publication of the next number of the Bulletin could be noticed. So, in place of the expected grouses came a flood of congratulations on the method adopted to meet the drastic demands of war-time conditions.

"Important Link in the Chain of Goodwill"

Explaining to their readers the reasons for the change, the editors told how the Bulletin had been a "shop window" for the company's textile machinery and how, in a large degree, it had been an almanac of what was new in the cotton world. They told how the news-letter would present regularly to the cotton industry brief but informative "snaps" of the latest developments. Its second purpose—and the more important—they said, was for it to be an important link in the chain of goodwill between the

(Please turn to page 17)

Re-planning to Meet Rush Jobs

Staff Co-operation Enables Engineering Firm to Complete Important National Contract without Disturbing Normal Work

SOME short while ago we were asked whether we had any spare capacity which could help to produce 500,000 blue prints for work of national importance, time being a primary consideration.

After promising every assistance, we set about to obtain the best results we could. No extra staff or new machines were installed.

The drawings to be printed were mostly 9½ in. × 14 in. and 19 in. × 14 in. size; for these cut sheets of printing paper were used. Other drawings were 27 in. wide and varied from 24 in. to

War production imposes many heavy strains on industry. Seldom, however, has a firm been able to meet a sudden national demand with the promptness and skill described in this article.

The merit in this achievement obviously lies very largely in the degree of co-operation the management was able to secure from its staff.

54 in. long, for which rolls of printing paper were used.

After attempting to run the extra work in with our own normal work, it was decided to keep the fast printing machine on our own work, and to produce the smaller sizes of prints on a slow printing machine.

"Payment by Results" achieves Unprecedented Speeds

By careful motion study it was found that each operator could feed and print four drawings in the width of the machine. If, say, eight copies of each drawing were required, the prints were left in the tray until the whole eight copies were obtained. Counting of only one lot of prints in the tray was necessary, hence only one quarter of the time was taken. All similar prints were kept together and fed through the washer and dryer, so that the operator taking the prints from the delivery side of the machine had no sorting to do.

Payment by results was introduced, and it is interesting to note that on the small sizes of prints, the fast printing

machine, with printing speed of 18 feet per minute, could only have produced 25% more output than the slow printing machine with printing speed of 5 feet per minute.

During several week-ends both machines were run on the Saturday afternoon and all day Sunday with ten operators in attendance each half-day. The thirty operators consisted of the usual print room staff, augmented by junior draughtsmen, tracers and typists.

The production of large prints, using rolls of paper, presented a

by
an Executive of
Alfred Herbert, Ltd.



These girls, with other members of the staff, sacrificed lunch hours and week ends to get this job completed

problem but fortunately the prints were required in much smaller quantities.

Again payment by results was adopted and sufficient junior draughtsmen were found who volunteered to work half their lunch-time to keep the machines running.

Prints not washed during the lunch period had to be washed and dried along with our own normal work when it was possible.

What Newspaper Readers Want

Attention-Getting Advertisements Must Have Different Style Now

THE newspaper reader is changing, becoming more intelligent, more sophisticated; so much so that most of the cherished traditions in favour of "right-hand facing," "next to women's editorial," may have to be scrapped.

A two years' continuous research on advertising readership of 24 newspapers by the United States Advertising Research Foundation shows that:

Size doesn't matter.

Among the 90 best-read ads., 27 were from 70 to 300 lines, 51 from 301 to 1,000 lines, only 12 were 1,000 lines or more.

Position doesn't matter.

Many advertisements in the back part of the paper attracted more readers than some advertisements for similar products and of a similar size in the front part of the paper.

There is a slight preference for left pages.

Position on page doesn't matter.

Market for product largely governs attention an advertisement gets.

Newsiness is vital.

People like pictures of people.

Nine out of ten of the best-read tobacco product advertisements were

built around movie stars or people whose names are in the news.

Readers do like smiles.

So one old fetish still stands.

Readers like "YOU" copy.

The second stand-by left us.

Women like advertising to be helpful.

All of the best toilet requisite advertisements were designed to help the woman solve some problem of personal care. Among the best-read grocery ads., six out of ten carried recipes.

Readers like humour in drink copy.

Says *Printer's Ink*, commenting on this report (published by the American Newspaper Publishers' Association): "It's not the size that counts, it's not the position that counts, it's the advertisement."

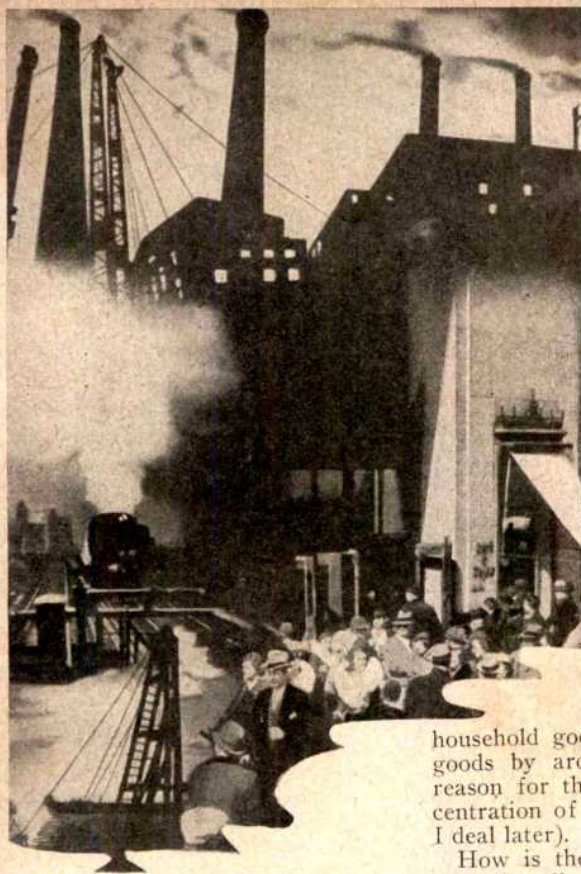
We agree. As the public becomes more familiar with advertising, it is becoming less gullible, less easily pleased by the tricks and stunts, also more open to new ideas, more ready to study a reasoned case.

For the rest, continuity is the greatest factor in securing conviction. Better thirteen small spaces than an isolated splash.

TREND OF TRADE

Plan for a Further Fall in Consumption

Says CECIL CHISHOLM, M.A.,
Business Consultant



A MONTH ago I estimated the real fall in consumption at 40%. Yet the Board of Trade is certain that only 50% of the pre-war supply of goods is available for sale. Failure of consumption to fall to this level it correctly attributes to the "cushion" of accumulated stocks now rapidly diminishing.

How much more light can we get on the subject?

With the cost of living index practically useless, with wholesale price up 50% or over, with wages up slightly over 20%, with the movements in population still continuing, it is almost impossible to gauge the level of consumption accurately.

However, the Oxford Institute of Statistics has now done all that is possible. By cutting out seasonal variations in shop sales, by forming a quarterly index from the Bank of England shop sales figures, by allowing for changes in population (using the official map published in *BUSINESS* four months ago) most serious errors should have been avoided.

Consumption Has Only Fallen 13%

THE Institute concludes that the fall in consumption per head of household goods is probably at least 35%. The consumption of all goods per head has fallen by only about 13%. Sales of food have fallen from 3 to 8% per head, clothing by 35%.

Admittedly, the cost of living index cannot be used as a test for the present rise in prices. From available figures, however, the Institute estimates that

the price of household goods is up by 25%, clothing by 75%. Food is up by at least 20%.

However prices may rise, we must expect a further fall in consumption of household goods of about 15%, of all goods by around 37%. Here is the reason for the Board of Trade's concentration of retail shops (with which I deal later).

How is the present spending buyer actually dispersed? What is the magnitude of the drift of refugees to the West, of war workers to the Midlands and the North?

Scotland Spends 20% Over Average

THE Institute puts the increase in consumption in Scotland since mid-'38 as 20% above the national average. Unhappily there is no possibility of estimating the change in population here. In the North-east and North-west shops have risen by 13% over the average with a rise in population of but 2% and 1% respectively.

With a rise in population of 5% the Midlands and South Wales achieve only the same rise above average consumption, i.e. 13%. With an increase of no less than 11% in population South England increased consumption by only 11% over the average. The failure of the South to keep pace with Northern and Midland consumption per head is extremely significant.

Prosperity is shifting back again towards the North. But I am surprised that the low pre-war consumption in the North compared with the Midlands clouds the issue. It is obvious to the visitor that the Midland people are spending more per head than those in the North.

The London figures are depressing, but less depressing than one expected. Central and West London with a fall of 52% in population decreased consumption considerably less. With a much lower fall in population (19%) the London Suburbs would appear to

have decreased consumption more than proportionately. Over all of Greater London the fall in consumption was but 25% below the average.

Still No Ceiling to Wages

THE White Paper on Price Stabilisation is a miserable namby pamby affair. Its feeble warnings will get us nowhere.

The vicious spiral which inevitably translates higher wages into high costs, and higher costs into higher prices is an imminent danger. Yet the Government placidly remarks "The policy . . . therefore, is to avoid modification of the machinery for wage negotiations and to continue to have the various voluntary organisations and wage tribunals free to reach their decisions in accordance with their estimate of the relevant cause." In actual fact, only if price fixing, rationing and limitation of supplies can keep the cost of living index at a dead level, is inflation avoidable on these terms.

But as rationing and limitation of supplies have failed so far to avoid the index rising from 145 to 199, so long as a large variety of goods are unrationed, so long as there is no limitation of wages, there can be no prevention of inflation.

Inflation is Already Here

IN fact, inflation is here. Witness the queues in every prosperous factory town for almost every article of food, witness the black market; witness the wages being paid to unskilled workers in aircraft factories.

Sir Walter Citrine's rejoinder is therefore logical. If wages are to be controlled, prices and profits must be controlled. Prices can be controlled by a wider system of rationing such as was employed in the last war. E.P.T. already limits profits on most of the war industries. It can be revised to fall more equitably as between the firms with "good" and "bad" profit bases.

If the Government had a stronger grasp of the economic trouble these vital steps would be taken; inflation would be avoided; and the country would save untold expense during the war and suffering after it.

Concentration Includes Contraction

IT was announced in the House that the Board of Trade's scheme for the concentration of production has resulted in 110,000 workers and 16½ million square feet of factory space being released for War purposes. Sir Andrew Duncan said that the Board was now proceeding to nominate nucleus firms in these sections of industries not covered by voluntary arrangement. So the above figures are likely to be considerably increased.

Several of the City editors have suggested that the release of 110,000 workers is a disappointing result. The mountain that labours to produce a mouse has been cited. But this figure is the release of workers as from the beginning of concentration on March 4th. It does not take into account the hundreds of thousands who have left the industries due to contraction before concentration was applied. Nor of manufacturers who leave an industry rather than be "concentrated."

In most of the factories that have been concentrated, a good deal of substitution of older for younger workers, especially women, has taken place. This substitution has not been taken into account either.

Has Concentration Done Its Job?

IN the cotton industry, concentration is almost complete in the spinning (277 mills nucleus, 198 closing) and weaving (300,000 looms will remain out of 500,000) sections. In the finishing sections it is not so far advanced, but many schemes have already been initiated and some have been approved. The most important consideration has been the need to maintain essential production despite the large degree of contraction of the industry and the exceptionally urgent demands for labour.

In the carpet industry, at the request of the manufacturers, nucleus firms were chosen by the Board of Trade. Last March employment in this industry was about 17,000, and it is estimated that the concentration scheme will bring this down to about 7,000 or even less.

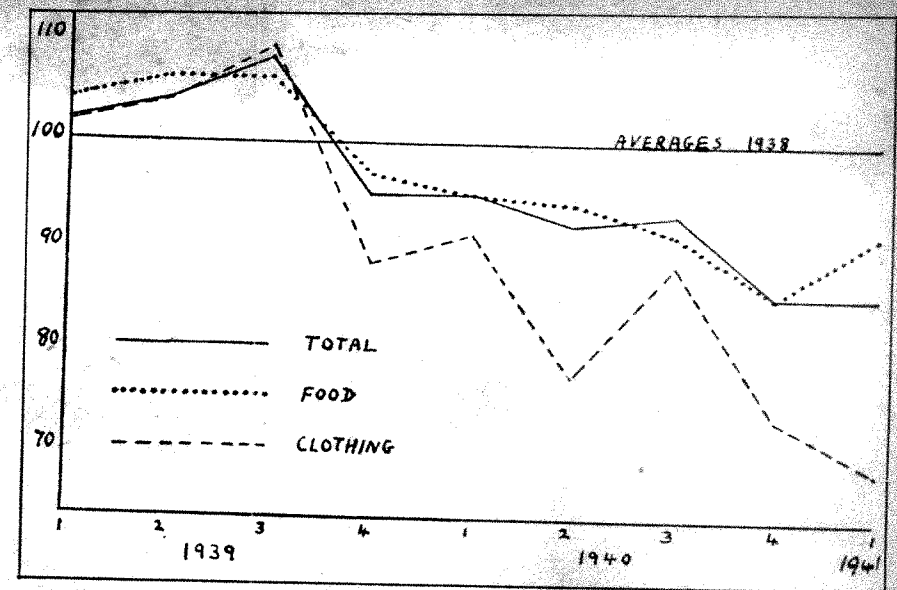
In the piano industry there will be seven nucleus firms which will be engaged chiefly on export work.

Of the rayon industry's three sections, viscose, cuprammonium and acetate, concentration of production has taken place in the first two sections only.

Concentration has done its job fairly efficiently, but the job was not so big as it looked. And it is not finished yet.

Some Shops Want Concentration

WITH making of goods for home consumption reduced to 50%, it is clear enough that every street in the country contains redundant shops. How



This graph shows that total drop in consumption is only about 13%, whereas clothing purchases have decreased by at least 35% as compared with the last quarter of 1939 (Oxford Institute of Statistics Graph)

to cut the number of shopkeepers without (a) Causing unnecessary suffering; (b) Infuriating the housewife.

The exploratory questionnaire of the Advisory Committee should reveal a good deal about the traders' point of view. Fortunately there are two representatives of the workers and two of the producers on the Committee as well as Professor Sargent Florence (who must surely be responsible for the 37-question questionnaire).

History of retail concentration will one day make interesting reading. While industrial concentration was opposed to by almost every industry concerned, it is the shopkeepers who have forced the pace on retail concentration. This vital questionnaire is clearly devised to give the Committee more information than is now available in the retail trade of the country.

Study of *Marketing Survey of the U.K.* may have convinced them of how shops vary, not merely from trade to trade but from county to county, even from town to town. Sometimes local tastes are accountable, in others the rapid rise or decline of the town's industries. Allowances will have to be made for these factors at last. Someone will have to estimate the number of customers that really justifies a one-man, two-man, or three-man shop of each type.

No doubt the questionnaire will also disclose whether any retail trade expects compensation to be paid by the Government. Any such expectations are doomed to disappointment. With each industry compensating its own surplus concerns, is it conceivable that the retail trade will be allowed to pass its burden to the tax payer?

I am certain that concentration of certain retail trades, notably grocery, mens' wear, women's wear, drugs, confectionery and furniture will yield more youthful, fit personnel for the factories than all of the concentrated industries put together.

The Prime Minister's Refusal

MR. CHURCHILL'S refusal to appoint a single executive for the control of Production is a calamity. Nothing less. Every man in charge of production knows this.

Lord Beaverbrook will have even his capable hands full in re-organising and galvanising the inchoate mass of administrative services called the Ministry of Supply. For this includes control of the Ordnance factories, of all private concerns working for the Army, of all the material controls, and half-a-dozen other fields as well. So we cannot look to him for co-ordination of production also.

It is clear that neither the Prime Minister nor the Government realise the problems involved in priorities, raw material shortages, bottle-necks, dispersed production.

NEWS-LETTERS WILL KEEP GOODWILL ALIVE

(Continued from page 14)

firm, as manufacturers, and the readers, as customers.

One of the most attractive features of the news-letter, according to many of its readers, is the fact that it has created much of comparative interest by combining details of machines manufactured by the other members of the group alongside Platt Bros.' own products.

What this one group of manufacturers has been able to achieve may be followed by any other firm which has the unenviable task of keeping its markets alive and interested at the present time. The Editors of *BUSINESS* will be pleased to offer their expert advice on the basic principles for producing such publications.

ORDERED

REQUIREMENTS

MATERIAL REQUIREMENTS & PURCHASE REQUISITION

REQUIREMENTS OF MANUFACTURED COMPONENT PARTS

KEY TO CODE

4 OLD REQUIREMENT
7 NEW REQUIREMENT
1 ON ORDER

Four of the record sheets used in the operation of this valuable stock checking system. These forms provide the buying department with complete details of current requirements and possible requisitions

How We Killed the Bogey of Stock Wastage

EVERY manufacturer, even on a small scale, knows the colossal wastage that is inevitable when large stocks of raw materials and necessary component parts have to be carried. Thousands of pounds can be wasted every year by haphazard purchasing while, even if stock ordering is carried out in the most careful and judicious manner, it will mean that a very substantial amount of capital is needlessly tied up in stocks that may not be required for many months.

The extent of the stocks we carried under the old system may be gauged from the bald statement that we market over 300 different products, 60 of which may be classed as major lines. Even the smallest of these products has over 40 component parts. This obviously meant that we had to carry a wide range of stock utterly disproportionate to our immediate or conjectured requirements.

Existing Mechanical Accountancy System Gave Idea

We have been users of mechanical accountancy on a very wide scale for many years and it was realised that it would be possible to extend the application of the system we used to our purchasing and stock-keeping.

The method we evolved was the work of many months' research, as nothing of the type had ever been attempted before. Even now, with the system having over a year of successful operation behind it, we know

This Comprehensive Mechanical System Reduces Stock Purchases to Immediate Requirements for Orders in Hand

By the Secretary of a Leading Engineering Equipment Company

improvements can be made. These developments are, naturally, made only when we prove that they will be of substantial benefit to our work.

The basis of this company's scheme is that raw material and component parts are ordered only against definite production orders. Such orders are issued solely at the instigation of the directorate and establish that a certain quantity of a given type of product is to be put in hand.

What is involved in the particular production batch in terms of raw material or purchased parts is, of course, known for the purpose of scheduling by means of component parts lists prepared by the drawing office. The method of quickly ascertaining this information for the purpose of ordering or requisitioning is interesting.

Every Product is Broken Down to its Essential Parts

For every standard product a series of master cards has been punched, one for each component part or piece of raw material, stating the "number off"

and quantity of each that is required. These cards are maintained in a permanent file. The first move, then, is to abstract the appropriate set of master cards to cover the appliance under review and to list them—a matter of a few minutes only—on the tabulator. This gives a complete list of everything required with the quantity of material for making one such appliance. All that is necessary is to multiply these figures by the number of appliances to be produced to ascertain the actual requirements in bulk.

The situation is complicated by the fact that in any given product there may be complete main assemblies, sub-assemblies, purchased parts and raw material, but this is taken care of by a clear indication shown on the material list reproduced. The complete product is thus broken down into the smallest detail.

From this point everything would be plain sailing if each production order started from scratch, as in the case of a new product. All that would be required would be the issue of a number of purchase orders and

requisitions on the sub-production departments.

In actual fact, however, the vast majority of such orders are repeats of previous production and, therefore, note must be taken of two factors: stock of parts or material in hand and parts or material already ordered but not yet delivered or finished. This is accomplished by the keeping of two ledger accounts, both of them posted and balanced on the tabulator.

From the completed material list, that is, after the calculation of totals has been made, new requirement cards are punched which are posted to the debit of a "requirement ledger," a specimen sheet of which is illustrated above. The balance outstanding is picked up from a balance card in the normal posting manner and a new balance struck and card punched.

Two Ledgers Prove Guide to Current Requirements

Credits to the ledger are similarly posted from cards punched from either goods received notes or (in the case of manufactured parts) from delivery tickets. The balance at any time, therefore, represents all requirements outstanding and normally is a diminishing figure as parts come forward. A credit balance, should one occur, at once indicates surplus stock.

So much for total requirements. How much of this calls for the issue of a purchase order or requisition on manufacture is disclosed through the medium of the second ledger referred to, viz. "ordered" ledger. Debits in this case are posted from cards representing orders placed, while credits are from the same goods received cards as were used in the requirements ledger. The ordered ledger strikes a balance between goods received and goods ordered and the balance at any time represents orders placed but not executed.

Careful Coding is Secret of Success of Whole System

The method of ascertaining the material required to be purchased and the parts to be made for each production order is a mechanical operation in which the following cards are run together through the tabulator:

- (a) The requirements balance cards on hand before receipt of the production order;
- (b) The requirements for the production order to be dealt with;
- (c) The ordered ledger balance cards.

The figures listed as a result of this operation represent the difference between outstanding requirements and unexecuted purchase orders. It is these lists that become the actual requisitions issued to:

- (a) The buying department to order the necessary material from supplier;
- (b) The factory to manufacture component parts.

This description gives, as briefly as possible, a consecutive outline of the

HOW MUCH CAPITAL HAVE YOU TIED UP IN STOCK?

The most careful and judicious method of ordering can mean that a very substantial amount of capital is needlessly tied up in stock that may not be required for several months.

This firm cut out all waste by ordering only enough to meet current orders. Even material used for service repairs has to be ordered separately.

system as it is, but it may not be out of place to refer to one or two matters of greater detail.

In the first place, attention might be drawn to the carefully constructed coding which is an essential to success. In this case provision is made for the complete codification of every part or sub-assembly, and all raw material is also adequately coded.

In any system there are bound to be occasional deviations from standard practice, and in this respect this company is no exception to the rule. For example, parts may be drawn from stores for some purpose which was not scheduled at the outset. Typical requisitions of this type are for repairs, installations and miscellaneous sales orders, the quantity of which cannot be anticipated. These requisitions, which are not, of course, covered by production orders, are distinguished by their order class number and must be pulled and tabulated so that requirements cards may be punched.

Machine Cards Provide a "Live" Order File

Again, suppliers, frequently deliver over or short of the actual quantity placed, thus producing a debit or credit balance in the ordered ledger. To correct these discrepancies adjustment cards are punched.

And now a few words as to what eventually happens to the cards. After posting the requirements ledger the cards are sorted back into their various groups:

1. Balance cards from previous posting (dead);
2. Requirements cards and special requisitions—(dead);
3. Deliveries to stores—go to ordered ledger (made);
4. Goods received cards—go to ordered ledger (purchased).

After posting the ordered ledger the dead balance cards are extracted and the remainder (i.e. purchase order and goods received cards) are merged with the purchase orders live file, which contains cards for every open order or partial delivery on such order.

A tabulation of these cards shows, against each purchase order number the supplier, production order number, quantity ordered, quantity delivered and balance outstanding. A total is accumulated to show the balance against each separate part number.

This tabulation shows up immediately any under or over deliveries.

As a purchase order is completed the cards are pulled from the file so that it contains only open orders, care being taken to see that no cards are pulled unless orders and deliveries are equal. Otherwise the balance shown on the tabulation will differ from the balance shown in the ledger.

A further tabulation of manufactured batch orders and deliveries to stores, from a batch order live file, is made in exactly the same way as that for purchase orders.

A Monthly Check is Made for Costing Purposes

Other tabulations include a comparison of requirements and orders, separately, as between purchased parts and made parts in order to review shortages and excesses of requirements. Each month, for costing purposes, a tabulation is made of all manufactured parts delivered to stores to date for which purpose all delivery cards are sorted away from the ordered ledger live file and tabulated, showing part number, batch number, quantity and partial or final delivery.

From this latter tabulation, cards are punched for each final delivery and serve as heading cards on the completed cost tabulation. They are also used to split the ordered ledger live file between orders completed and orders still open, by matching them with the ordered ledger cards on the collating machine and extracting any cards which agree.

Value of System far Outweighs Cost of Installation and Operation

A further use is made of the master material cards already employed for preparing the material list, to ascertain whether any redundant stock is being carried. This is achieved by matching the master material cards covering products on outstanding production orders with the balance cards from the stock record ledger. By the use of the collator, every stock item not required for current production is automatically ejected. A tabulation of these cards is submitted to a salvage committee, thus keeping redundant stock under close control.

It was the company's managing director, who, with commendable foresight, realised that stock could be more efficiently controlled by limiting purchases to production orders. In due course, therefore, an extension of mechanised methods was considered necessary. Additional equipment was installed and through the tabulations the buying department, in issuing orders on suppliers, now knows the position with far greater speed and accuracy.

This very complete and efficient scheme of control is an achievement of considerable economic value to the company. The benefits and control obtained far outweigh the intrinsic cost of running the system.



FIVE SHORT CUTS to . . . *Office Efficiency and Economy*

How To Speed Up The Opening Of Mail

THIRTY to forty letters can be opened simultaneously by rigging up a simple device such as the following. All that is needed is a wooden block covered with a sheet of medium-coarse sandpaper.

A group of letters are held together and tapped on a level surface until the top edges are level. Then the sandpaper-block is drawn across these level edges with a slight sweeping motion several times. No damage is done to the enclosures and the envelopes are not ripped except along the top edge. They can easily be used again with economy labels.

Show Employees Where the Money Goes

ONE firm which had experienced considerable trouble with its labour force, at a time when its finances were somewhat straitened, overcame this disgruntlement by telling all its employees what happened to every pound the company earned.

With the wage envelopes one week was enclosed a little graph which showed that materials and supplies absorbed 45 per cent. of the earnings, that wages and salaries ate up 32 per cent. Other figures shown were taxes 14 per cent., interest on capital 2 per cent., and other manufacturing, distribution and miscellaneous expenses 7 per cent.

When the staff were told these facts most of the grouses of the staff vanished.

Emergency Help During Rush Periods

THERE are few offices that do not experience departmental rush seasons. Often one department will be overcrowded with work when others are not busy. Much of the difficulty resulting from these emergency problems can be overcome when there is a proper listing of employee qualifications. A cross index record of every employee by secondary experience or training should be completed. Thus, Miss X is regularly employed as an operator of one type of

accounting machine, but she may also have had experience on an entirely different type. Her name should be filed under both jobs, to give a record of her dual abilities.

When emergencies arise extra operators can be found by quick reference to the personnel records. Many employees who feel contented with their work may hesitate to inform office managers of their secondary qualifications. But it is important that these facts be known because it helps in switching employees to different departments during rush work.

One office manager who uses this system has a possible substitute for every key worker in the office, so that illness, holidays, rush periods and other emergencies seldom find him without proper personnel.

Follow-up System Brings Answers to Letters

BUSINESS men who find it difficult to keep track on unanswered letters might do well to adopt this simple follow-up system, which has proved efficient when used by one firm over a period of years.

When the typist or transcribing-machine operator types the letters, have her take two carbons of the letter on different coloured sheets, say one of yellow and the other of pink. The yellow sheets

are then sent to the general files, or whatever files are used for the correspondence of the executive in question. The pink sheets are placed in a file dated ten days ahead.

When the ten days have elapsed, the pink carbon is placed on the desk of the executive who dictated it. If a reply to the letter has been received, the pink carbon can be thrown away as there is no further use for it. On the other hand, it may serve as a valuable and timely reminder that the letter has not been answered. A follow-up letter can then be dictated.

Eliminating Expense Of Monthly Statements

THE expense of mailing statements each month is particularly high at the present time and a number of companies are trying to economise on this item. In the accounts department of many businesses accounts are paid on the invoices, which are carefully sorted and filed, and the statements are only thrown into the waste paper basket.

One firm is overcoming this by sending out a reply card with the first invoice to all customers. The customers are asked to check "yes" or "no" as to whether they required a monthly statement. They report that 80 per cent. of their customers do not need or want statements. Collections have not suffered to any extent by the elimination of statements where the customer says he does not want one.

Gentlemen:

In an effort to eliminate unnecessary clerical work, and to save paper, we would appreciate your indicating below if you desire a monthly statement.

We want a monthly statement.....

We do not want a monthly statement...

Signed.....
(name of firm)

A return postcard to customers will weed out those who do not require monthly statements, thus doing away with unnecessary posting and paper costs

BUSINESS Guide to War-Time Law

By JOHN BURKE, Barrister-at-Law

Editor: Loose-Leaf War Legislation;

Encyclopædia of War Damage and Compensation

Mr. Burke, one of the leading authorities on business law, prepares this digest to explain briefly every important Act, Order or Regulation coming into operation during the current month.

The notes which follow cover the period from July 7, 1941. They are arranged in alphabetical order and numbered. A cumulative index covering all previous notes is to be found at the end.

The references in these notes, e.g. S.R. & O. 1941 No. 939 are references to the Statutory Rules and Orders of 1941 published by the Stationery Office.

53. Aliens

As to the registration of Austrians, Germans and Italians employed in industry see S.R. & O. 1941 No. 1020.

54. Clothes Rationing

The Consumer Rationing (No. 2) and (No. 3) Orders 1941 (S.R. & O. 1941 Nos. 939, 1011) make important amendments in the rationing scheme (as to which see June issue para. 23). As to seasonal goods see S.R. & O. 1941 No. 940; as to ships stores, No. 1012; as to the return of coupons surrendered, No. 1013; as to the use of rationed goods by registered traders in the manufacture of unrated goods, No. 1014; as to officers' uniforms, No. 1015; as to hire and supply on approval, No. 1016; as to glass replacement, anti-scatter fabrics and certain surgical goods, No. 1017; as to the supply of cloth and hand knitting yarn to registered persons, No. 1018; as to clothes for miners, No. 1090; as to supply to unregistered makers-up, No. 1091; as to protective clothing, No. 1093.

55. Debtors and Creditors

The procedure by which a debtor who, owing to war circumstances, is unable to meet his obligations and is anxious to avoid bankruptcy, or, in the case of a company, winding-up (see July issue No. 39) is prescribed by the Liabilities (War-Time Adjustment) Rules, 1941 (S.R. & O. 1941 No. 942). These Rules are as important to creditors as they are to debtors.

The general procedure is for the debtor to apply to the adjustment officer. In London the adjustment office is at 6, Bedford Square, W.C.1. Elsewhere the address of the adjustment officer is obtainable from the local County Court. The adjustment officer will arrange an interview at which the debtor must make a full disclosure of his financial position. The adjustment officer will either inform the debtor that he does not consider he can help him or tell him to apply to the Court for a protection order, or he will take steps towards making a scheme of arrangement by giving notice to all the creditors requiring them to lodge proofs of their debts as in bankruptcy. A meeting of creditors will usually be held to consider the scheme. If the scheme is agreed to by the debtor and all or a majority in number and value of the creditors and is a fair one it will be approved by the adjustment officer and be binding on the creditors. A dissenting creditor may, however, appeal to the Court to have the scheme varied or revoked.

If a scheme of arrangement is not arrived at the debtor can apply to the Court for a protection order. The effect of a protection order is to prevent any obligations being enforced against the debtor without the leave of the Court. During this period of grace the debtor's affairs will be reported on by the adjustment officer and after all parties have been heard the Court will consider the making of a liabilities adjustment order under which very considerable adjustments can be made in the obligations of the debtor and the rights of landlords, mortgagees and other creditors.

56. Finance Regulations

Reg. 3E of the Defence (finance) Regulations, 1939, provides for the payment of sums which cannot be transferred abroad into blocked

accounts. The investments authorised for sums standing to the credit of such blocked accounts are specified by S.R. & O. 1941 No. 844.

57. Food

Biscuits: licensing and control; S.R. & O. 1941 No. 961.

Bread: licensing of producers; S.R. & O. 1941 No. 980.

Cheese: prices; S.R. & O. 1941 No. 945.

Chocolate: drinking; S.R. & O. 1941 No. 1079.

Current prices: S.R. & O. 1941 Nos. 1050, 1078.

(Continued at top of next column)

59. Income Tax and Surtax

The following is a summary of the provisions of the Finance Act, 1941, relating to income tax and surtax.

(1) **Rates of Tax.** The standard rate of income tax for 1941/42 is 10/- in the £ (S.4). surtax will be payable on incomes for 1940/41 in excess of £2,000 at the same rates as last year (S.5.). Surtax will be payable on incomes for 1941/42 in excess of £1,500 (S.4.).

(2) **Reliefs.** (a) the reduced rate is 6/6 in the £;

(b) earned income relief reduced from one-sixth to one-tenth with maximum allowance of £150;

(c) age relief reduced from one-sixth to one-tenth of total income;

(d) single person's personal allowance reduced from £100 to £80;

(e) married man's personal allowance reduced from £170 to £140;

(f) additional personal allowance in respect of wife's earned income altered from five-sixths to nine-tenths of the earned income; maximum allowance remains at £45;

(g) exemption limit reduced from £120 to £110 (S.6.).

(3) **Post-war Credits.** The extra tax borne by the reductions in earned income, age and personal allowances and exemption limit are to be credited to a person after the war. The amount to be credited cannot be assigned or charged (S.7.).

(4) **Diminution of Income.** The relief given in S.11 of the Finance (No. 2) Act, 1939 where there has been a diminution in earned income is continued (S.8) where the total income for 1938-39 is higher than the income for the current year, the limit of one-sixth for relief in respect of life insurance premiums is based on the higher income (S.9.).

(5) **Farming Profits.** Farming profits are chargeable to tax under Case I of Schedule D instead of under Schedule B (S.10), except where the annual value does not exceed £300 (S.11). Market gardening profits are also chargeable under Case I of Schedule D. (S.10).

(6) **Collection of Schedule A Tax.** A number of alterations have been made in the machinery for collecting tax in cases where the premises are subject to a base (SS. 12-16 and First Schedule). Where the premises suffer war damage and the rent ceases to be payable or is reduced, the burden of tax can be adjusted (S.16).

(7) **War Injuries to Employees.** Payments made under special war-time arrangements providing extra benefits for war injuries are not deductible in computing profits (S.17).

(8) **Concentration of Industry.** Where factories have been closed down and production transferred to a nucleus concern under the schemes for concentration of industry during the war, the displaced concern is not to be treated for income tax purposes as having discontinued its trade and the nucleus concern is not to be treated as having commenced a new trade. Payments made by the nucleus concern to the displaced concern are allowed as deductions to the nucleus concern and treated as trading receipts in the hands of the displaced concern. Wear and tear is allowable to the displaced concern (S.18).

(9) **Exceptional Depreciation.** Exceptional war-time depreciation is allowed for income tax pur-

Eggs: control and prices; S.R. & O. 1941 Nos. 974, 1049, 1,114.

Feeding Stuffs: control; S.R. & O. 1941 Nos. 990, 994, 1080, 1082-1084.

Fish: canned; control; S.R. & O. 1941 No. 975.

Flour: S.R. & O. 1941 Nos. 1069, 1070.

Jam: prices; S.R. & O. 1941 No. 970.

Lard: prices; S.R. & O. 1941 No. 1106.

Meat: imported canned; S.R. & O. 1941 Nos. 955, 956, 1085.

Milk: powder; S.R. & O. 1941 No. 981; condensed; No. 1065.

Onions: green; prices; S.R. & O. 1941 No. 1031; crop control; No. 1120.

Oranges: prices; S.R. & O. 1941 No. 982.

Peas: prices; S.R. & O. 1941 No. 1081.

Potatoes: prices; S.R. & O. 1941 No. 1041; crop control; No. 1060.

Rationing: miscellaneous amendments; S.R. & O. 1941 Nos. 984, 1107.

Tapioca and Sago: prices; S.R. & O. 1941 No. 983.

Tea: licensing and control; S.R. & O. 1941 No. 1022.

58. Gas Supplies

Gas undertakers are not prohibited from raising the price of gas where the terms of supply provide for variation of price in accordance with the price of coal or the quantity of gas supplied; see S.R. & O. 1941 No. 882.

poses on the same lines as already allowed for Excess Profits Tax (S.19).

(10) **Set-off of Losses.** A loss in a trade or a profession or a vocation may now be set off against profits in any other trade, profession or vocation in an assessment for 1941/42 and subsequent years (S.20).

(11) **Evacuation.** Persons chargeable under Cases I and II of Schedule D or under Schedule E may be assessed in the districts to which they have evacuated (S.21).

(12) **Employees Remuneration.** The limit of income below which remuneration need not be returned is reduced from £120 to £110. Where employment is not for a full year the limit is proportionately reduced (S.22).

(13) **Travelling Expenses of Weekly Wage Earners.** Where the place of work or residence of a manual wage earner who is assessed half yearly has been changed owing to the war additional travelling expenses up to £5 are to be deducted from the wages assessed (S.22).

(14) **Tax Free Payments.** Where a person is under an obligation to make a tax-free payment, e.g. where interest is payable at such a gross rate as after deduction of tax will have a fixed net rate or where an employer has undertaken to pay an employee's taxes, the obligation is limited to making such a payment as would have been tax free before the war; the recipient is liable to bear the war increase of taxation.

(15) **Time for Lodging Case Stated.** The time for lodging cases stated is increased from 7 to 21 days (S.47).

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Four Ways to Encourage Punctuality

Four Executives, inspired by recent articles on Absenteeism and Unpunctuality in BUSINESS, tell you of the methods they employ to reduce these problems

ONE

SSELECT some employee who is never late and single him or her out for special congratulations. One of the difficulties in dealing with the tardiness problem is that the worker who is never late is seldom complimented by the management. Many employers feel that it is an employee's duty to be at work on time, that the prompt employee is doing no more than he or she is paid for and, therefore, deserves no special commendation. But when a habitually late worker hears a prompt employee receiving praise it hurts more than if he or she is "bawled out" for being late. Post the names on bulletin boards of employees having long records of perfect attendance.

TWO

ORGANISE employees by departments and encourage each group to vie with others in perfecting attendance records. When employees find that an otherwise perfect attendance record is being spoiled by one or two habitually late comers, they will quickly pounce upon the tardy ones and bring them in on time. Employees are notoriously stricter about these matters when permitted to deal with them in their own way, than when the management takes a hand. The management is inclined to forgive, to overlook and to relax rules. In connection with this method it has been found worth while to give a cup or trophy to the best department.

THREE

REALISING that often the unpunctuality of a worker might be due to war-restricted traffic conditions, and understanding the frame of mind of an employee who may have left home in plenty of time only to be delayed by some irksome hold-up, one firm decided to make strict punctuality an attraction, even if it meant the worker would have to allow time for possible delays en route. Each department was treated as a separate unit and if the department as a whole did not have an unreasonable number of "lates" in any month, an employee in that department who had a perfect record of attendance during the month was entitled to a mid-week half-day's holiday with pay. This time off had to be taken within sixty days of earning it and was to be fixed by arrangement with the depart-

mental manager. The likely prize-winners saw to it that their extra holiday was not jeopardised by their fellow-workers—in fact, the employees who has previously had bad records for their lack of punctuality became the keenest to arrive in good time. With two months in which to arrange the half-day holiday, the department managers are able to select a day when work will be reasonably slack and actual production not unduly impeded.

FOUR

FINING late workers, making them sign slips acknowledging lateness, and other such plans may seem to encourage punctuality, but the net result is often a group of disgruntled employees. Here is a plan which works because it is good-humoured. Use some sort of comic animal, such as a donkey. If the employee is frequently late—say two or three times in one week—place the miniature animal on his or her bench or desk, chaining it to some stationary object with a padlock. Leave it there until some other employee piles up an equal or worse record. Many an employee will be cured of the habit of coming to work late just to escape to the jibes of fellow workers.

BUSINESS Guide to War-Time Laws and Regulations

(Continued from page 21)

* 60. Industry

Under Location of Industry (Restriction) Order, 1941 (S.R. & O. 1941 No. 1100) no person may, without a Board of Trade licence use as a factory or warehouse any premises with a floor area of 3,000 or more feet super which were not, on the "prescribed date" being already used for such purposes. Similarly, premises of the same area, which on the prescribed date had been or were used as a factory or warehouse, may not without a Board of Trade licence, be used for any trade or business which was not being carried on at those premises on that date. The "prescribed date" is the date on which the Order comes into operation. This has not yet been fixed. The Order does not apply to local authorities.

Premises used for the storage of articles for not longer than 28 days are exempt but the Board of Trade must be informed in writing of such use within 10 days from the day on which such use began; see S.R. & O. 1941 No. 1101.

61. Limitation of Supplies

Supply to Metropolitan Police; S.R. & O. 1941 No. 1057; silk half hose; No. 1058; cloth and clothing; Nos. 1091–1093; supply to W.V.S.; No. 1119.

62. Motor Vehicles

No person may acquire the ownership of a registered mechanically propelled passenger road vehicle (other than a trolley vehicle or tramcar) constructed for the carriage of not less than 10 persons and their effects except by licence granted by or under the authority of the Minister of War Transport; see S.R. & O. 1941 No. 963.

63. National Service

The National Service (Armed Forces) Act, 1939, S.14 provides for the reinstatement by employers of employees at the end of their service. The rules for preventing evasion of this have now been extended to persons called up for civilian service; see S.R. & O. 1941 No. 871. The provisions as to the adjustment of the contracts of employees and apprentices are similarly extended; see S.R. & O. 1941 No. 878.

64. Price Control

The Goods and services (Price control) Act, 1941 makes further provision to prevent excessive prices being charged for goods and excessive charges being made for performing services in relation to goods (including hiring and subjecting to a process). The Act also amends the Prices of Goods Act, 1939.

The Board of Trade may by order fix the maximum price for any description of goods. The Board may prescribe a mark

to indicate that the goods are price controlled. Goods sold by auction and goods for export are exempt (S.1.).

The Board may by order fix the maximum charge to be made for performing any description of service (S.2.).

Where price-controlled goods are offered for sale with uncontrolled goods, the prospective buyer may require the composite offer to be analysed to show the price asked for the price controlled goods. Similar provisions apply to an offer to perform services including price-controlled services. The Board of Trade or a price control committee may also require the information (S.3.).

Holding up the sale of stocks is prohibited. It will be a defence for a person charged with holding up stocks to prove that he was asked to sell in a manner contrary to normal practice or that the sale would involve a breach of a lawful obligation or would interfere with the orderly disposal of stock amongst regular customers (S.9.).

The Act is to be enforced by price regulation committees who have considerable powers of inspection and of demanding information (SS. 11–15.).

65. Purchase Tax

Gifts by wholesalers and manufacturers for the relief of distress are exempt (Finance Act, 1941 S.45.).

66. Raw Materials, Manufactures and Commodities

Chrome, magnesite and wolfram: control; S.R. & O. 1941 No. 1076.

Iron and Steel: control; S.R. & O. 1941 No. 1010; foundry bonding materials; No. 1077.

Leather: control; S.R. & O. 1941 No. 1005.

Potash: control; S.R. & O. 1941 No. 931.

Ramie: control; S.R. & O. 1941 No. 1056.

Willow Rods: control; S.R. & O. 1941 No. 1006.

67. War Damage

Local authorities are given special powers of salvaging and storing property from war damaged premises; see S.R. & O. 1942 No. 917, para. 3.

Local authorities may carry out repairs to houses without first satisfying themselves that the owner is unable or unwilling to repair the house, and they have absolute power to carry out urgent repairs (Repair of War Damage Act, 1941).

Under the War Damage Act, 1941, the "risk period" in respect of damage to land ended on August 31, 1941. This is now called the "first risk period." The "second risk period" extends from September 1, 1939, to August, 31, 1942, and payments will be made for damage occurring during the second risk period in the same way as for the first risk period. (War Damage (Extension of Risk Period) Act, 1941).

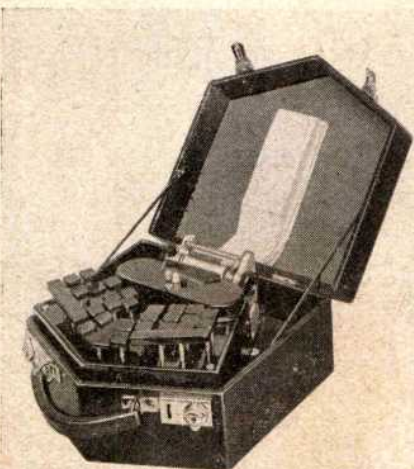
NEW

10 SHORT RUN DUPLICATING IN FIVE COLOURS

A reproducer specially designed to handle short run duplicating jobs, has just been added to the range made by a leading British firm. This machine, in common with the seven others made by the same company, can reproduce on any size of paper up to 13 in. by 16 in.. It does not require special papers and satisfactory results can equally well be obtained with tissue or heavy papers, manilla or thin board. Other notable points in its favour are that it can reproduce in five colours at one operation, running costs are negligible, no inks, gelatine or stencils are required and no cleaning has to be done.

11 NEW MACHINE FOR STENOTYPING

The first British built stenotyping machine has just been introduced. Among the many advantages claimed for it over its foreign-made competitors the foremost

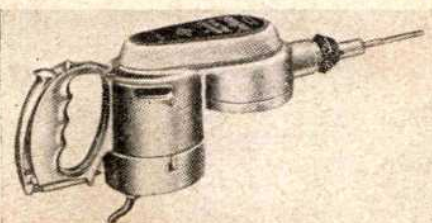


The new British stenotyping machine

is that the extra keys it possesses—it has a third more than any other machine—gives the operator a better range and therefore greater speed and accuracy. A competent operator can easily acquire a speed of 180 to 200 words a minute.

12 ELECTRIC HAMMER FOR WALL DRILLING

This, hammer for jumping holes in brick, stone, concrete, etc., employs a



Electric hammer for holes up to $\frac{1}{2}$ in. dia. 170-watt universal electric motor running at 4,500 revs. per minute. It drills holes up to $\frac{3}{8}$ in. in diameter.

for the Office Transport, Factory ARP and Lighting

•Readers are invited to make use of this valuable information. The name and address of the manufacturer of any product described may be had on application to the Editor, BUSINESS, Whitefriars House, Tallis Street, London, E.C.4. To simplify your request you may refer to the items by number only.

•Manufacturers and distributors are invited to send complete information about their new products for inclusion in this feature.

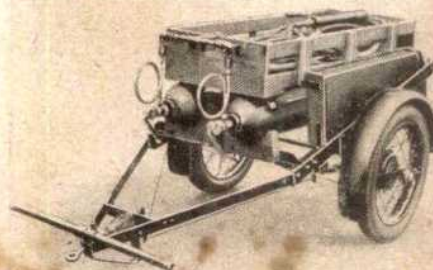
13 HANDBOOK OF WORKSHOP PRACTICE

Two men who play an important part in the training of young men and women for engineering work, have produced a handy little textbook "Workshop Ways." As a trainee's introduction to general workshop practice this little book gives a very comprehensive picture of engineering shop work. Separate sections deal with the prevention of accidents, workshop calculations, reading of workshop drawings, precision instruments, tools and materials. The price of this little handbook is 1s. 6d.

14 MOBILE TRAILER FOR CO2 EXTINGUISHERS

The value of carbon dioxide for the rapid extinguishing of fires caused by highly inflammable liquids is well-known. Being an inert gas it smothers the flames by displacing or diluting the air so that there is not enough oxygen remaining to support combustion. Being a non-conductor of electricity this gas is also of great

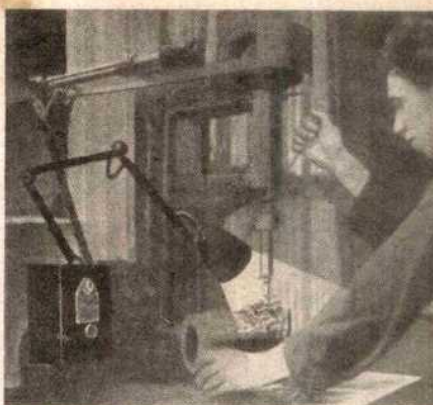
value for electrical fire risks. The great handicap to wide use has been the bulk of the containers for the gas, but this has been overcome by the production of special



One of the new CO2 container trailers trailers and tenders, as shown above. A number of 50 lb. cylinders can be carried on a single trailer.

15 LIGHTING FOR LOCAL ILLUMINATION

This small wall-mounted air-cooled isolating transformer, rate at 50va at

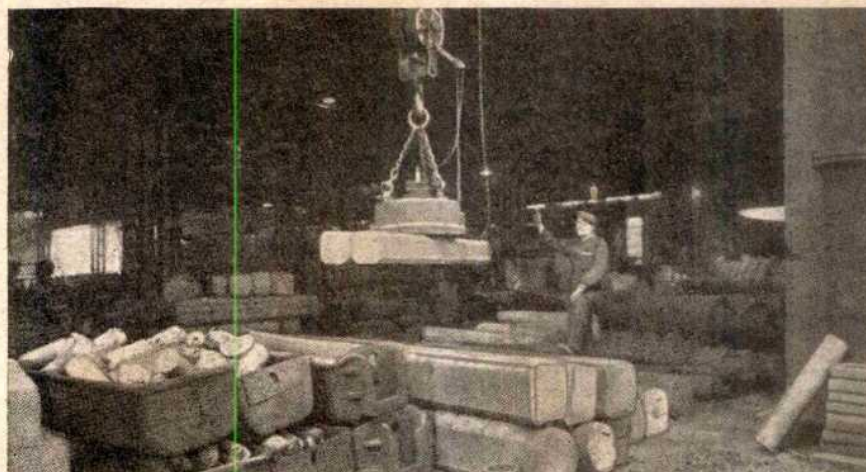


New 3-arm lamp for close work

400:50 volts, 50 cycles, is suitable for local lighting of machine tools.

16 LIFTING MAGNETS FOR FACTORY TRANSPORT

Magnetic materials as hot as 700 deg. Centigrade can be lifted safely with these magnets, shown here in the 36 in. diameter size. Automatic control reduces current after the first few seconds, resulting in a cooler operating magnet.



Metals as hot as 700° C. can be lifted with this magnet conveyor

A.R.P. for the Factory and Office



Are You Wasting Your Daylight ?

How to Solve the Problem of the Blacked-Out Factory

MANY firms have devoted both thought and money to their artificial lighting, but have ruined their natural lighting by blacking out their factories.

If a firm of electrical lamp manufacturers could produce a lighting system which would give a completely natural light, comparatively free from shadows and, except for a moderate installation charge, an average of 13 hours lighting per day free of all cost, most industrial concerns would be interested.

It is probable that most factories would install this marvellous system. At any rate, it is not likely that a new management finding such an arrangement already installed would deliberately and at some cost, scrap it.

Yet Nature, combined with the architects who designed the factory, has installed this system, and hundreds of well-run concerns have decided to scrap it. We refer, of course, to natural daylight through windows.

Daylight Helps to Tone-up Morale

The writer has visited a great many factories where the operatives work in perpetual gloom. It is small wonder, that workpeople sometimes are over-anxious for the completion of their day's work. Some managements have installed electric lighting that only just meets the Government requirements.

During the last winter months, except for lunch-hour intervals, there were factories whose workpeople did not see daylight from Sunday to Sunday. They rose in darkness, worked by artificial light, and departed in darkness. This was followed by a short evening meal before sleeping in a crowded shelter. This cannot be beneficial to the health or nerves.

It is, moreover, ruinous to the eyesight. In an office in London the large skylight and the windows which gave

natural light were blasted by the November raids and boarded up. Again, the management did not improve the electric lighting. By March, 1941, every member of the office reported a deterioration of eyesight and 33½ per cent, had the lens of their spectacles altered in one way or the other. Although renewal was costly, a new skylight was installed. The sense of relief was reported as enormous and a general "tone-up" in morale was effected.

In another concern of national reputation, blackout blinds were installed and the paint on the glass was removed. When the first blind was raised to admit the daylight a spontaneous cheer broke out from the hundreds of girls working.

Bad Blackouts Exclude Light and Air

During the early part of the war, millions of windows were painted out. It was cheap, blackout fabrics were unobtainable and it was a quick method of commencing night work. There is, however, no such excuse now. Materials are obtainable during the summer months. Blackout blinds, removable shutters or curtains, may be installed at leisure.

Moreover, long daylight enables the blackout contractor to work long hours. He, at least, is unable to work after darkness. Furthermore, blind-makers have gained considerable experience since September, 1938, when the necessity of excluding lights was first realised seriously.

Another of Nature's great gifts—fresh air—is also being neglected. Nevertheless, normal ventilation is

possible. Whilst the blackout is in use it is now possible for the windows to be left open. But such blinds, shutters or curtains should be strongly constructed and scientifically designed by a reputable firm or else trouble will ensue.

With roller blinds, cross-ribs should be firmly sewn in at intervals, and ventilation allowed to pass through baffled grooves and casing at the top. There is one ingenious patent blind, quite reasonable in cost and extremely reliable. With curtains there are various light-proof ventilators on the market, one being of light fibre sewn into the curtain itself.

For the average factory window, a properly constructed industrial type blind for good all-round use cannot be excelled. An ordinary domestic blind merely adapted is rarely a success. Curtains are preferable in some instances, but again it must be borne in mind that rougher usage must be expected and allowed for in the design and weight of the fittings.

Both blinds or curtains may be successfully employed for patent glazing (commonly known as the hack-saw roofing), and will often prevent glass from falling on valuable machinery. Sliding shutters have been known to jump when distorted by an explosion as, unlike blinds or curtains, there is no "give."

Blackout Costs Can be Charged Against Income Tax

There are two objections sometimes raised against fitting blinds or curtains to saw-tooth roofs.

1. The cost is too high. This can be halved by blacking it out on the "hit and miss" principle, i.e. one bay painted out and one bay blinded.

2. Glare on the glass by moonlight. This is quite difficult to spot from a moving plane for long, but in any case, there is an excellent translucent paint which prevents reflection that may be applied cheaply.

Regarding Income Tax and E.P.D., the installation of black-out blinds or curtains is usually allowed as an expense. As for the Purchase Tax, the Government have so far recognised the importance of removable blackout in factories by exempting them from tax. The authorities stipulate, however, that the design must be such as to be unsuitable for office or domestic use.

In this regular feature ways and means of improving the A.R.P. organisation are discussed for the benefit of Executives in charge of A.R.P. Readers of BUSINESS are invited to send their A.R.P. queries to the editor. Information on every aspect of Civil Defence is available.

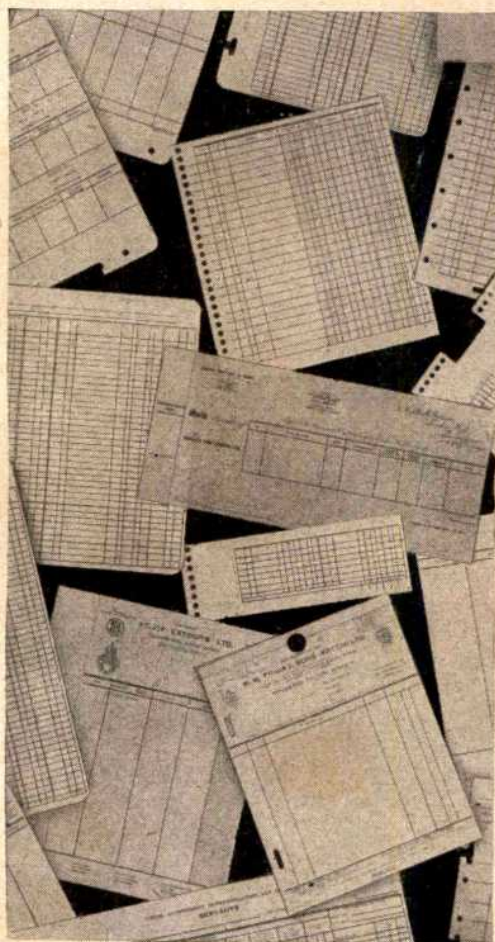
A new A.R.P. Device is described on page 23.

IF YOU HAVE
ANY EGGS...

Why



PUT THEM ALL IN ONE BASKET?



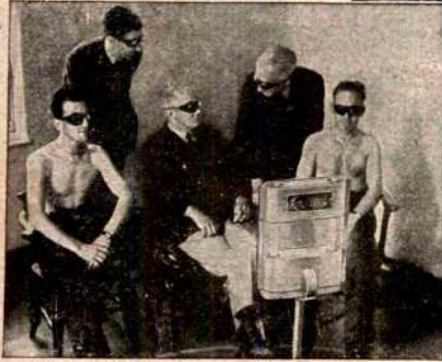
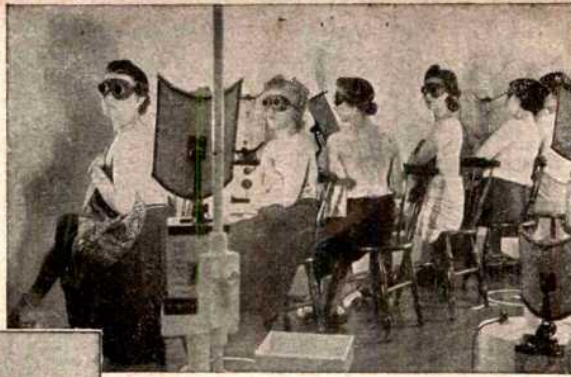
For safety's sake you should use accounting and record rulings which are standardised, and which can be rapidly replaced in case of loss—thus facilitating the restoration of normal business activities.

Kalamazoo have 150,000 designs available (for Loose-leaf, for Visible and for Machine Accounting) prepared for 60,000 customers. They cover practically all purposes. Very many of them are printed and are in stock—others are available at a few day's notice—to replace your lost records without trouble and delay.

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Girls of the Wolseley Motor Works having their Winter Sunshine (top) and Lord Nuffield with pilots of one of the night fighter Squadrons to which he has presented tonic sun-lamps



Absenteeism will be Reduced and Output Increased when Workers are "toned up"

Sunray Lamps Help to Keep Workers Fit and Happy

ARTIFICIAL sunshine turned on for each worker for a few minutes a day is keeping factory hands all over the country fit and full of energy.

Blacked-out factories and long working hours combine to deprive men and women in essential industries of much of their very necessary vigour. Fortunately, science had ready the solution to these health-destroying conditions. To-day, factories all over the country have installed batteries of indoor "sunbaths" to ensure that their workers shall have every chance of maintaining their health at its peak.

These "sunbaths"—lamps that radiate valuable ultra-violet rays to an extent even greater than the sun does in these latitudes—help workers to maintain energy, cheerfulness and resistance to infection. Hundreds of firms, ranging from retail stores to the largest manufacturers, have installed solarium—specially equipped rooms where this artificial sunbathing may take place—and let their employees attend them freely, even during working hours.

From factories all over the country reports have come to BUSINESS of the success attending the use of these lamps. Typical of these are:

Wolseley Motors, Ltd., of Birmingham, who, after blacking out their entire factory in October, 1939, installed sixteen sunlamps so that the entire staff—office and factory workers alike—could find compensation for deprivation of sunshine. Mr. W. M. W. Thomas, the former managing director, has said that over 97 per cent. of the workers take these indoor sunbaths twice a week. The firm allocate definite times for workers to attend during rest periods, etc., and as sunbaths take only two minutes each, hundreds can be toned up every day.

Absences from the Common Cold Reduced by Over 40%

At Cadbury Bros.' works at Bournville, Dr. J. B. Sherman, the medical officer, made elaborate and careful tests on 1,635 employees with various methods of preventing "colds." His tests showed that whereas the average

absence due to colds amounted to 106 days per 100 workers, in the ultra-violet ray group this was lowered to 66 days per 100 persons. He concludes: "It was found that the only method of real value was ultra-violet irradiation, which reduced both the severity and the number of colds in patients so treated."

From the Harland Engineering Company's works at Alloa come even more amazing figures. The firm's solarium, in an underground first-aid post, is open to all. Since it was installed among the office staff sickness has been reduced by nearly 60 per cent. and among the works staff by over 35 per cent.

Guy Motors Ltd., of Wolverhampton, have now had two winters' experience of giving sunrays to the staff and employees and the results obtained are impressive. The maximum time that any one is away from their work is ten minutes. Records show that less than 1 per cent. of the people who have taken the sunbaths have dropped out. Last winter's records show that of

(Please turn to page 28)

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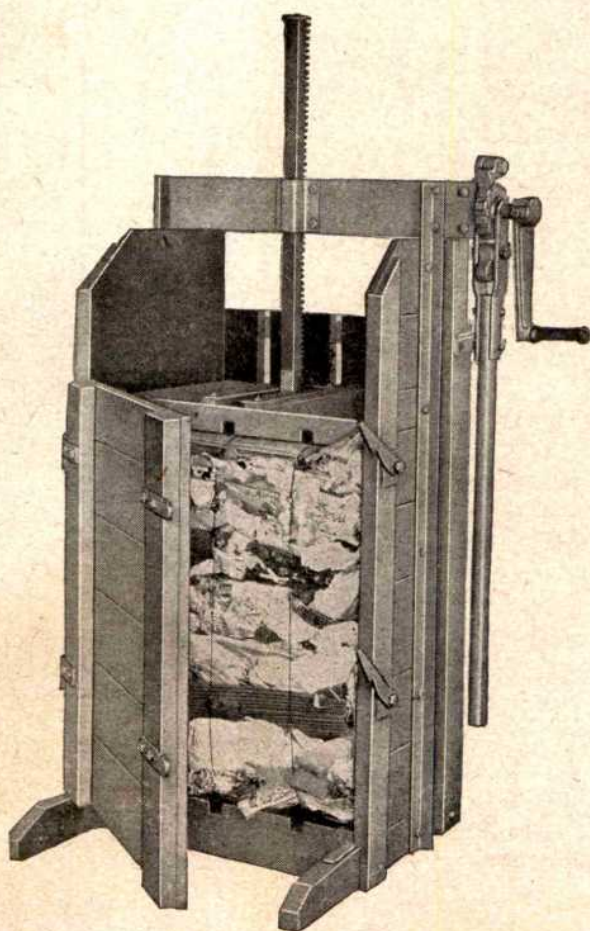
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THE NAVY WON'T STAND FOR SHRINKAGE. WHY SHOULD YOU?



THE Diesel engines of a submarine are placed on both sides of the central alleyway in the ship. The men who tend them are well protected in overalls that can't get too short in the legs or arms. That's because the cloth they are made from is mechanically shrunk so that no appreciable further shrinkage can occur.

FOR many jobs overalls are worn by the Navy now just as they are by the other Services.

Naturally, in the Navy, even overalls must be smart — must fit well, must be comfortable, must stand up to hard service. So a first essential for Navy overalls was — the cloth must not shrink.

No vague claims of unshrinkability were good enough for the Admiralty. They set a standard of shrinkage tolerance. It is a high one. It allows for no more than $\frac{1}{2}$ of 1% shrinkage in length or 2% in width.

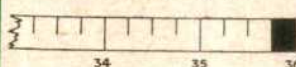
Uncontrolled shrinkage treat-

ments cannot comply with Admiralty standards. Some leave as much as 2 inches of shrinkage in the yard. See the difference between them and "Rigmel" mechanical shrinkage on the diagram below! No wonder mechanical shrinkage is wanted by the Navy!

Why not let your workers have overalls that are up to Navy standards in terms of non-shrink- ing? They don't shrink, they offer better protection, they look smarter, they keep their fit and comfort and they wear longer. Usually the cost of "Rigmel" shrinkage is paid by what you save on overall replacements and repairs alone. And it is well known that the output of workers improves when they are smartly and comfortably clad.

Most suppliers have "Rigmel". Shrunk overall cloth. Protective garments made from it are available through retail outlets for purchasers of small quantities.

Compare these diagrams



Overall cloth that is "Rigmel". Shrunk won't shrink by more than a negligible fraction in the yard.



Some so-called "shrunk," "fully-shrunk" and "guaranteed unshrinkable" overall cloths shrink by as much as 2 inches in a yard.



"Rigmel"-Shrunk Laundry-tested
REGD. against Shrinkage

Advertisement of THE BRADFORD DYERS' ASSOCIATION LIMITED
LONDON · BRADFORD · MANCHESTER

AGAIN REPRINTED

The Loose-Leaf Encyclopædia of WAR DAMAGE & COMPENSATION

Edited by **JOHN BURKE**,
Barrister-at-Law.

The best recommendation we can offer for this work is that many subscribers after buying one copy have come back for another, some have ordered up to half-a-dozen.

It obviously has what is wanted.

Two further reasons why it would be of use to you:

1. It is complete—that is to say it contains all the Acts and Orders relating to War Damage and Compensation—under one cover and one index.

2. It is in loose-leaf form, which means that the frequent and important changes are properly incorporated into the work.

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The accumulation of 21 months of war-time Acts of Parliament, Rules and Orders has resulted in a huge and intricate mass of material which it is impossible for the ordinary man to cope with although it affects him vitally in a hundred ways.

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Price: 6d. net; postage 1d.

The following popular pamphlets give in simple language the most valuable guide to problems of every-day occurrence:

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SAFETY VALVE

Management is continually under fire these days from trade union officials, civil servants, the press. Here we print monthly just a few of the harassed executives' grouses. Send us yours.—Ed.

"Slow to it"

A MARKED contrast to the methods adopted in Russia for praising workmen who make notable contributions to the war effort (*BUSINESS*, July, 1941), is the first reported case of two British boilermakers who were asked to do a special job quickly so that two gangs of riveters could get to work.

In a yard plastered with "Go to it" slogans, the two men snapped into it and did 37 hours work in 4½ days. Whatever the management thought of this performance, the welders' shop steward was not impressed. Saying the men had done too much work, he reported them to the Boilermakers' Society. Both were fined £3.

Acting on advice, the fines were not paid. The firm wisely said nothing but a report was sent to Labour Minister Ernest ("Go to it") Bevin. Perhaps he will impress upon the Boilermakers' Society that there is still a war on.

Too Few or Too Many?

WHEN the women of 25 and 26 registered recently, an official of the Ministry of Labour said that our war industry demanded 2,500 more women every week, and that the Ministry were getting nothing like that number. The "Too old at 40" slogan, said this spokesman, is being altered. Women are not too old at 60 to-day. The Ministry will take them even older than that if they can do a good day's work.

Yet there is another side of the picture: Women in the thirties are still finding it hard to get war work, or indeed work of any kind. Recently a woman of just over forty, who has had factory experience and had been an examiner, went to a Labour Exchange. "This is a different war from the last one," said an official, "there is no room for a woman over 35." Either Bevin or the Labour Exchange officials should correct their statements so that would-be volunteers know where they are.

Watch Latin-America!

A NUMBER of leading British exporters to Peru have cancelled all their advertising in the newspapers of that country because of the unprovoked aggression made by Peru against Ecuador. According to reliable authorities this aggression was fomented by Nazi propagandists, to make things more difficult for Britain in Latin-America. Nor is this an isolated incident. Nazi money has been used to stir up trouble in Bolivia, fortunately without avail.

Until his expulsion by the U.S. Government, Wiedemann the Nazi consul-general in San Francisco, was the prime mover in these Latin-American antics. His successor in the job is Baron von Thermann, Nazi ambassador in Argentina. It is to be hoped that for the sake of our valuable export trade to the sub-continent, Britain's representatives are keeping a close eye on von Thermann, so as to nip any little scheme of his in the bud.

Grouchy.

Sunray Lamps will Keep Workers Fit

(Continued from page 26)

those who attended only 3 per cent. were absent through illness, whilst for those who had not attended the sickness figures amounted to 10 per cent.—a striking testimony to the health-giving qualities of the installation.

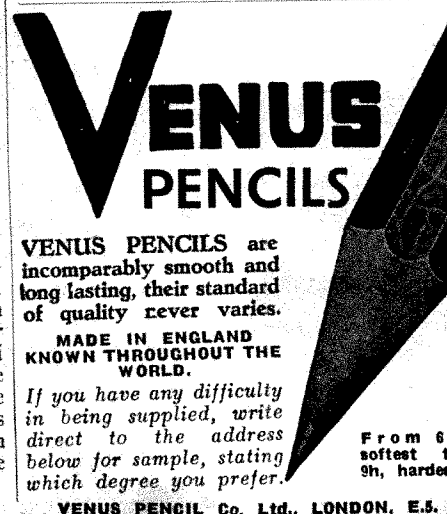
An interesting test is reported from Russia upon the output and percentage of errors in optical work, a process very suited to exact measurements. The findings show that the effect of indoor sunbaths was to reduce errors from an average of 9 per cent. to 2 per cent., whilst output increased to about one-third more than its previous level, and only began to drop back after the sunbaths had been discontinued nearly a fortnight.

A welfare solarium may be designed on any scale. Its operation is so simple that it becomes almost automatic. The elementary precautions—goggles, timing and so forth—are matters of common sense routine. It is found that supervision becomes quite nominal after the first week or two of operation.

Solaria May be Fitted up in First Aid Rooms

Even a small firm, with less than 50 employees, can easily fit a sun-lamp in the first-aid room, with simple instructions to use. At the other end of the scale, in a large enterprise, where the number employed may run up into four figures, it is worth while to provide a separate sunbathing room, or several such rooms in different parts of the works so that systematic irradiation can be carried out with the minimum loss of time to those concerned.

One of the most valuable advantages to be had from the use of sun-lamps is the reduction in absenteeism. This can be accounted for not only on account of the decrease in illness that artificial sunlight provides, but also by the general toning-up of the worker's body which means a reduction in fatigue. This latter point leads to an increase in the worker's productive ability and, therefore, helps to step up output.



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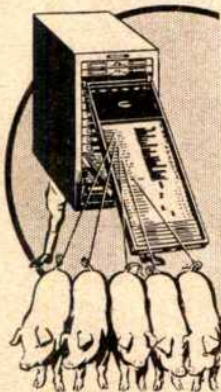
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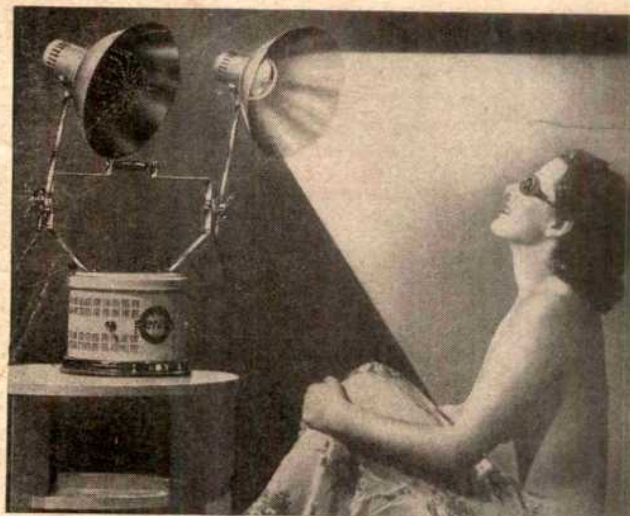
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This factory was planned as one in which working conditions would be ideal every minute of every day. Fog, or smog, it was known, would never dim the controlled "daylight" in this building. No wide variations of temperature would ever be known. The air within the building would be cleaner than out of doors.

Thus every shift of workers in every 24 hours (the factory is now on full war production) is now a "day shift." They leave capricious Nature outside and the workers enter a new world of comfort and high production efficiency.

Air Changing Can Cure Black-Out Foulness

Air conditioning plant, which made this wonder factory possible, is protecting the workers and processes from the sabotage of destructive abrasive dust, soot and even oil vapours and welding fumes. But this type of equipment need not be installed in wonder factories alone. Already many of the leading factories built many years ago now on full war-time production have adopted the same idea, to enable workers, who have to do their jobs under almost perpetual black-out, to do so under the most pleasant conditions possible.

Air is a wonderful substance. Although we are in intimate contact with it all our lives, we realise more and more as time goes on that we know very little about it: Yet there is hardly any phase of human activity or inactivity or any industrial process

. . . if You use Air-Conditioning Plant

by a Ventilation Authority

which is not in some way affected by the temperature, humidity, cleanliness, movement or other conditions of the air. It has an important bearing on our health and activity.

Exhaust Fans are Better Than Nothing

Dust extraction is now almost a fine art, and with scientific combustion in large factories and powerhouses, together with the wide use of electric power, air pollution in industry is greatly minimised. But the day and night use of factories that were designed to take advantage of ordinary forms of ventilation for several hours every day, but which are now restricted if not completely blocked up by the very necessary air raid precautions, make an extension of this air conditioning a matter of vital importance to all who work in these factories.

The applications of special air-conditioning plant, or extraction fans, are obvious. This type of equipment can give any factory atmospheric conditions which will ensure the maximum of productive energy on the part of the workers. But many firms, owing to the fact that they cannot spare the time to have structural changes made in their factory at the present time, are content to confine themselves to the introduction of an adequate battery of exhaust fans. These are at least better than nothing.

This Will Tell You the Size Fan You Need

Just as lighting can only be planned when the whole area to be illuminated has been closely studied, so can adequate plans for the fitting of fans be made when the whole factory structure has been examined. The following

table, however, will give an idea of the air delivery capacity of various sizes of exhaust fans. A reasonable margin over and above the capacity should be allowed for varying atmospheric conditions *outside* the factory, as well as for interference by structural pillars and large blocks of machinery and plant inside.

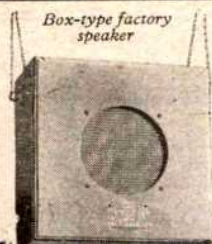
Diameter of Blades	Speed R.P.M.	Air del'y. cu.ft. p.m.	Consumption in watts.	
			d.c.	a.c.
6 in.	2,000	350	35	30
10 in.	1,400	550	40	52
12 in.	1,400	1,150	65	105
15 in.	920	1,550	65	105
15 in.	1,400	2,420	135	160
18 in.	720	2,010	86	125
18 in.	900	2,600	120	135
24 in.	550	3,800	115	200
24 in.	710	4,900	200	282
30 in.	500	6,230	270	325
36 in.	420	9,400	382	580
42 in.	350	12,200	430	670
48 in.	300	15,050	580	1,100

Humidity Control Can Increase Output

Even more important in many factories than equipment for changing the air alone is that which deals with the humidity of the building.

There are many industries in which humidity control is of equal importance to the energy of the workers. Often it is not recognised that the curve of output bears a direct relation to the state of the air in which the worker is compelled to labour.

BUSINESS offers its readers the services of an air-conditioning specialist to advise on the best types of equipment to meet your individual requirements. Letters should be addressed to the Editor, BUSINESS, Whitefriars House, Tallis Street, London, E.C.4, and marked "Air Conditioning" in the left-hand top corner.



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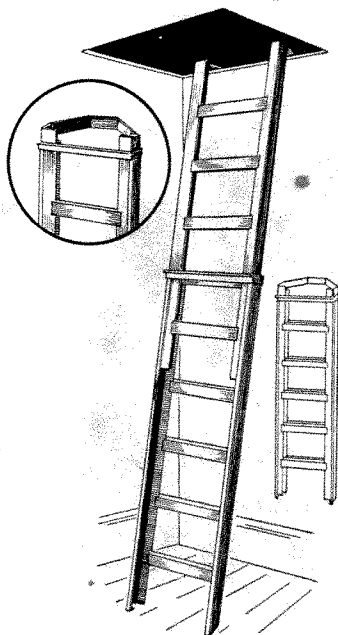
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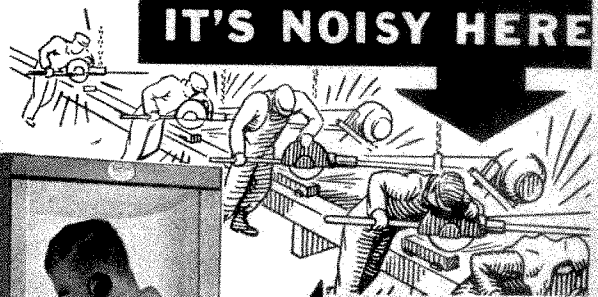
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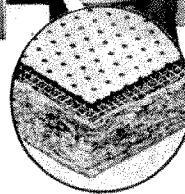
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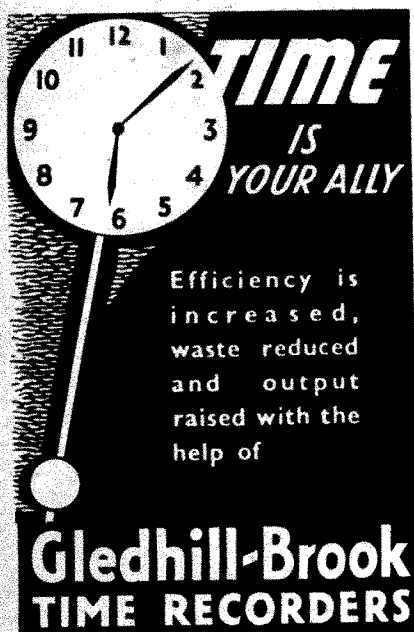
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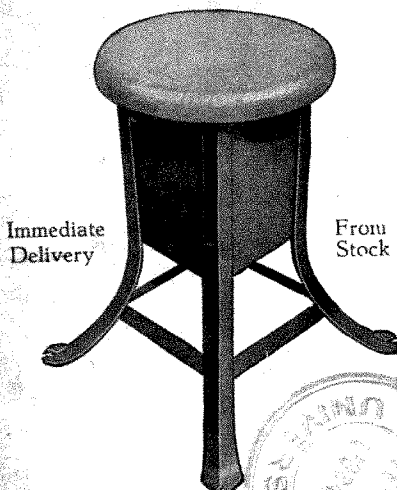
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B.H. Ltd. (Glasgow). *What powers have the authorities to affix public notices to the walls of a factory or other building?*

Anyone acting on behalf of the Government or local authorities may affix any public notice in connection with the war to any premises or vehicle. In order to do this, he may enter any premises. Where such notices are affixed, it is a criminal offence to remove or deface them.

War Damage Commission

H.E.M. (Hull). *Where are the Regional offices of the War Damage Commission?*

The addresses of the Regional Offices of the Commission are as follows:

1. **NORTHERN.** 5, Grosvenor Villas, Grosvenor Road, **NEWCASTLE**.
Area covered.—Northumberland, Durham, Yorkshire (North Riding).
2. **NORTH-EASTERN.** 38 York Place, **LEEDS**.
Area covered.—Yorkshire (East and West Ridings).
3. **NORTH-MIDLAND.** Magdala House, Lucknow Road, **NOTTINGHAM**.
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4. **EASTERN.** Winter Bowling Club, Brooklands Avenue, **CAMBRIDGE**.
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- 5A **N.W. LONDON.** Government Building, Bromyard Avenue, **ACTON, W.3.**
- 5B **N.E. LONDON.** Finsbury Square House, 33/37a Finsbury Square, **LONDON, E.C.1.**
- 5C **S.E. LONDON.** Clifton House, Euston Rd., **LONDON, N.W.1.**
- 5D **LONDON, S.W.** 55 Eden St., **KINGSTON-ON-THAMES.**
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9. **MIDLAND.** Midland Hospital, Easy Row, **BIRMINGHAM**.
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L.B. Co. Ltd. (Manchester). *Can expenditure on A.R.P. equipment, fixtures and fittings be deducted as trading expenses before the profit for income tax purposes is arrived at?*

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M.S. Co. (Newcastle-on-Tyne). *How does a non-enemy alien get permission to take up work in this country?*

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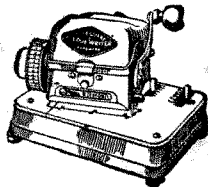
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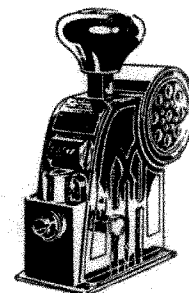
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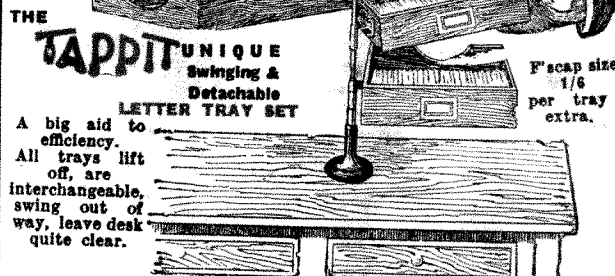
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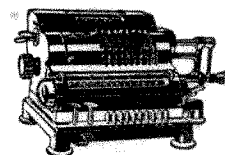
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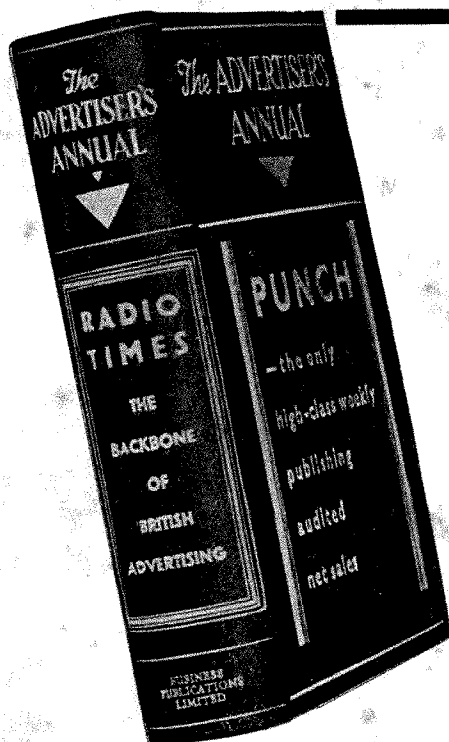
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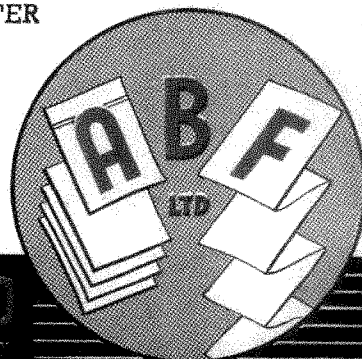
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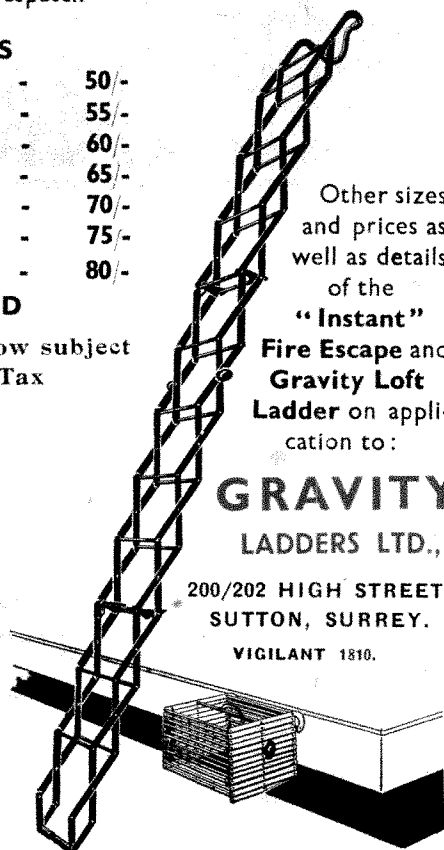
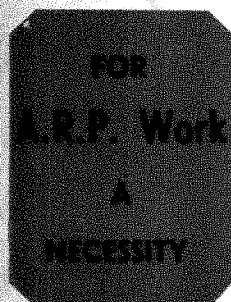
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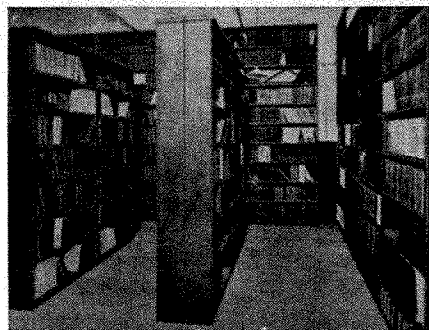
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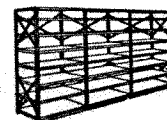
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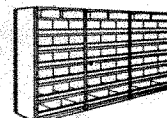
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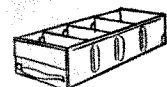
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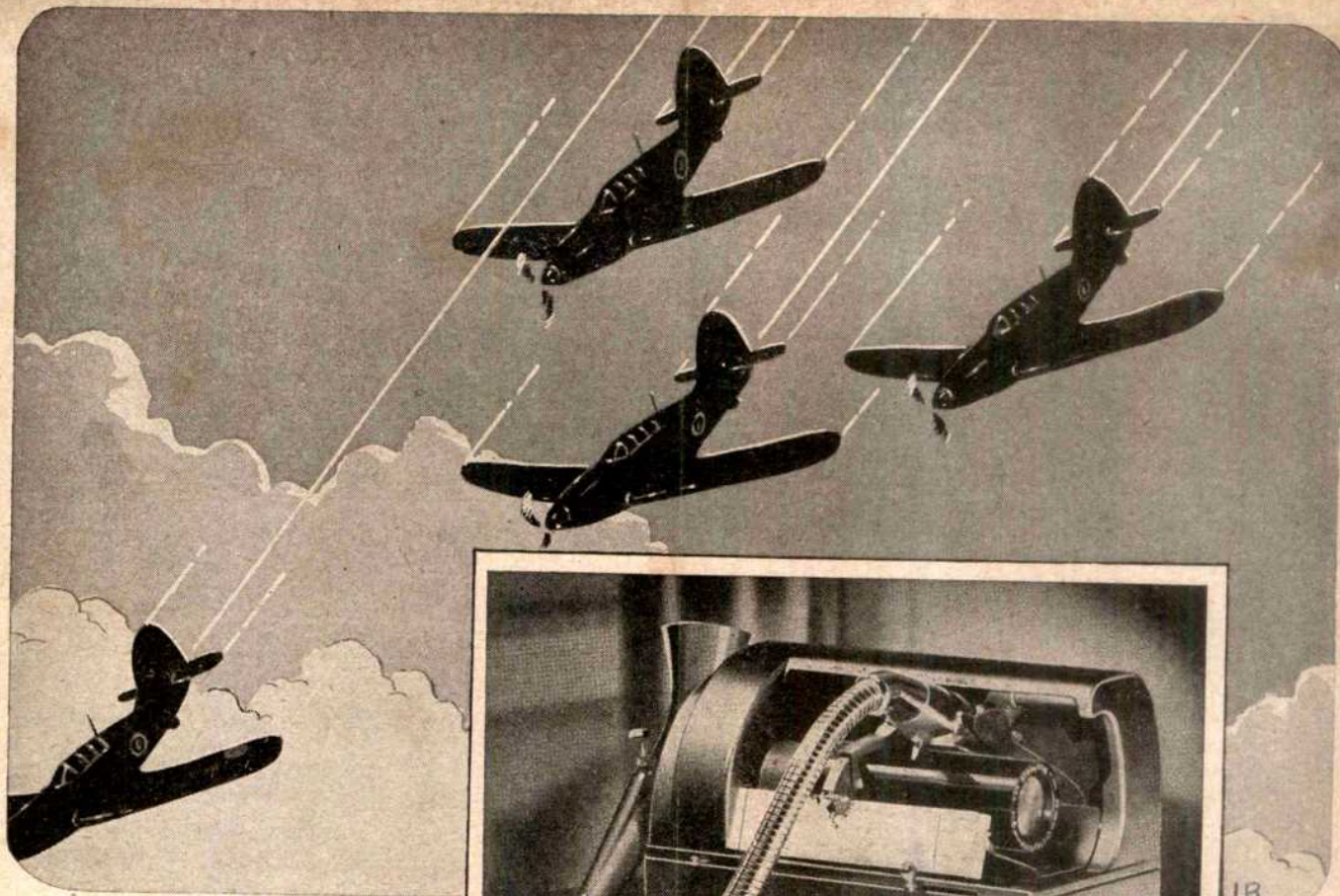
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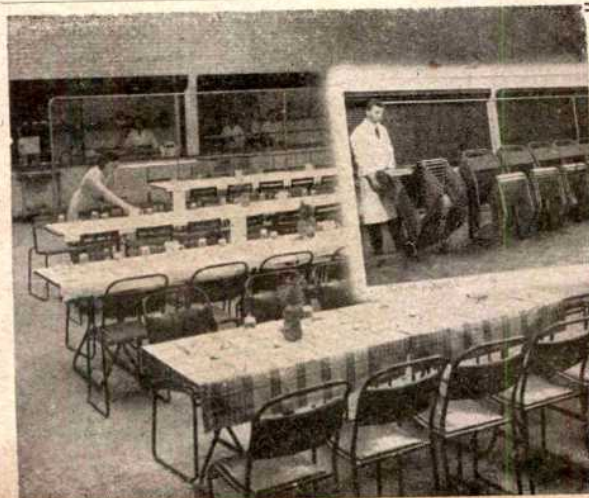
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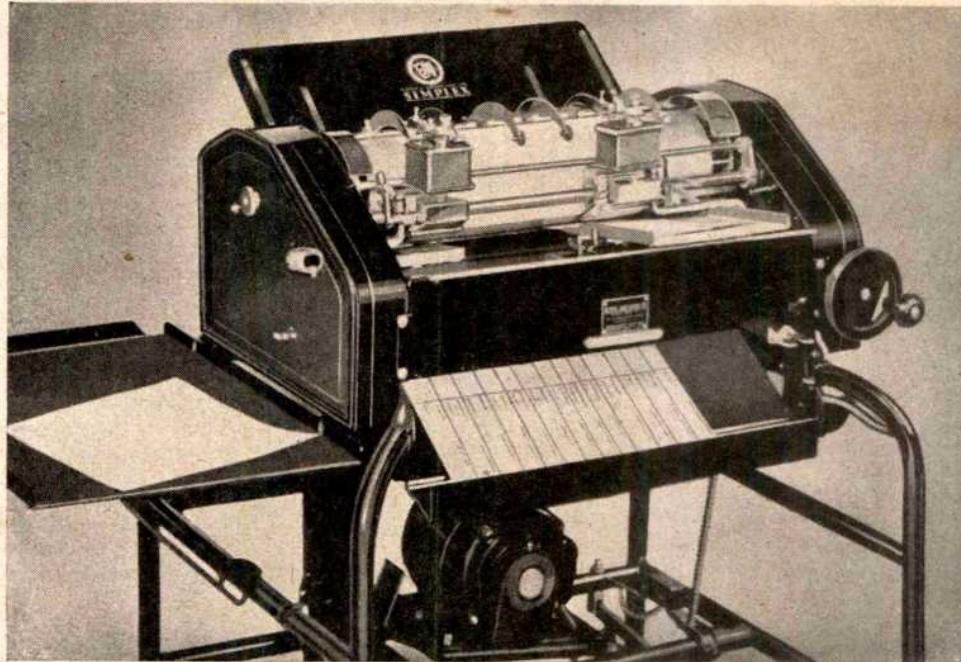
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BUSINESS Guide to War-time Law

Owing to pressure of space we have been compelled to omit this feature this month. Readers are, however, invited to send as usual their queries relating to problems arising from current Statutory Regulations, to be answered by our Legal Correspondent.

BUSINESS, Published by Business Publications, Ltd., Whitefriars House, Tallis St., London, E.C.4. Telephone: Central 9891. Subscription Rates: 15/- a year post free in the United Kingdom; 20/- a year post free in the Dominions and Overseas.

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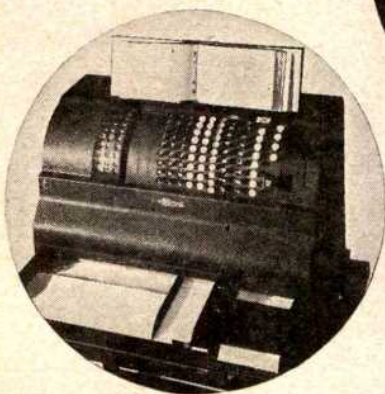
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ABSENTEEISM— Its Causes and Remedies

BUSINESS nation-wide survey shows 10 main causes ; 5 very, 7 less, effective remedies. Four new factors are revealed. Absenteeism is partly regional. Malnutrition is a dangerous new factor.

By CECIL CHISHOLM

STIMULATED by the warm reception given to our two enquiries into the causes and cures of absenteeism, we have conducted a third on a more extensive scale. To our questionnaire we have received an exceptional number of fully detailed replies. In addition, a considerable amount of field work has been done among factory directors and executives.

The result bears out my contention in previous notes on the subject. Absenteeism is not nearly so simple as the members of the Select Committee on National Expenditure would have us believe. In their first report on the subject, the Committee indicated that the mere stopping of Sunday work would do the trick. In their second

report on absenteeism in two filling factories, the Committee blamed difficulties of transport, absence of adequate accommodation, conditions of work—notably canteen arrangements—and Sunday work, which the Committee appeared to confuse with the seven-day week. In their report on output, the Committee get down to the subject more realistically.

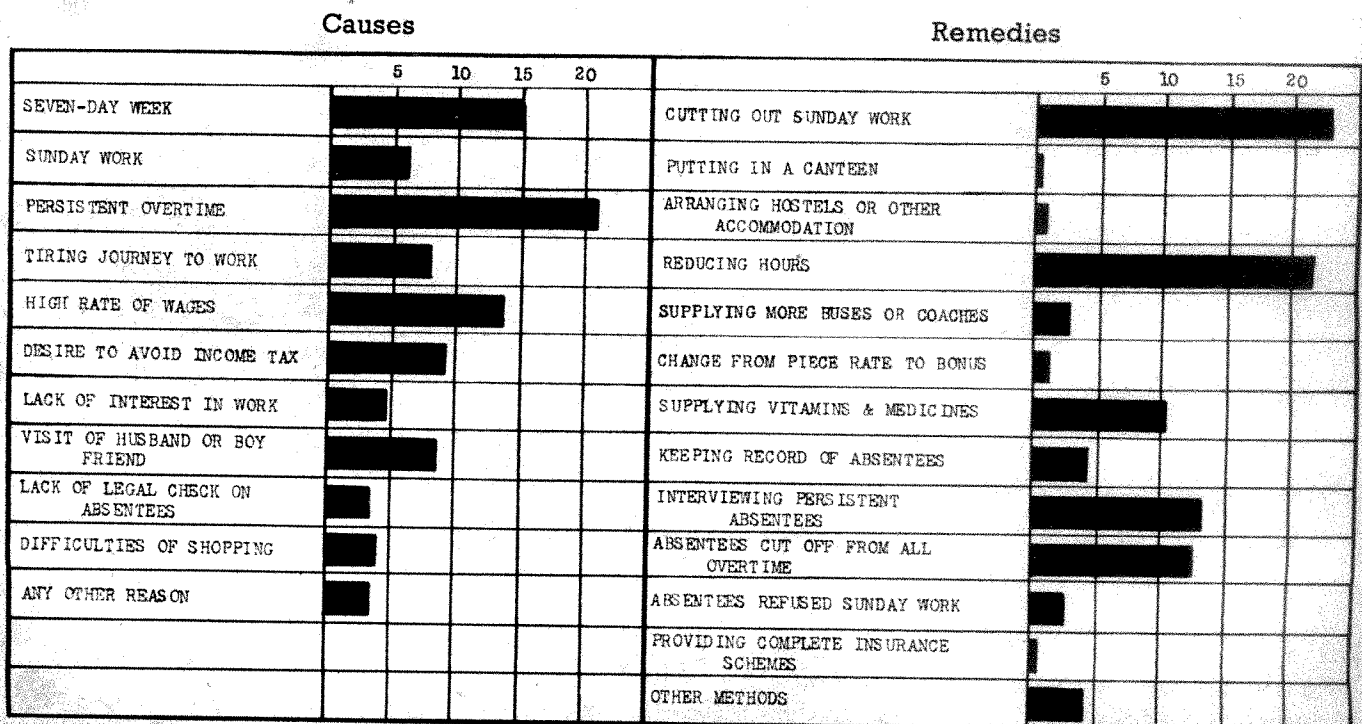
There Are Four Black Spots in the Country

It will be remembered that our own conclusions were that absenteeism was a functional disease and not a local symptom, that it was partly due to slack management that there were slack

workers; that a more active effort should be made by directors to keep personal contact with the workers and to be *au fait* with the workers' point of view.

This new survey emphasises the complexity of the problem. It also shows quite clearly that while many causes contribute to absenteeism, most managements find that one or two are the main source of the danger in their own works. Incidentally, four unexpected discoveries on the subject flow from the wide extent of the survey. It is clear from our enquiries that :—

(a) Absenteeism is partly a regional matter. The average reported absenteeism (including non-war factories) is higher in Birmingham



This chart gives the percentage of effectiveness of the various causes and remedies for absenteeism discovered in previous BUSINESS surveys. Percentages were arrived at by averaging replies from all factories.

SEVEN-DAY WEEK		CUTTING OUT SUNDAY WORK	
SUNDAY WORK		PUTTING IN A CANTEN	
PERSISTENT OVERTIME		ARRANGING HOSTELS OR OTHER ACCOMMODATION	
TIRING JOURNEY TO WORK		REDUCING HOURS	
UNCOMFORTABLE LODGINGS		SUPPLYING MORE BUSES OR COACHES	
56-HOUR WEEK OR OVER		CHANGE FROM PIECE-RATE TO BONUS	
HIGH RATE OF WAGES		SUPPLYING VITAMINS OR MEDICINES	
DESIRE TO AVOID INCOME TAX		KEEPING RECORDS OF ABSENTEES	
LACK OF INTEREST IN WORK		INTERVIEWING PERSISTENT ABSENTEES	
VISIT OF HUSBAND OR BOY-FRIEND		ABSENTEES CUT OFF FROM ALL OVERTIME	
LACK OF LEGAL CHECK ON ABSENTEES		TIME OFF FOR SHOPPING	
DIFFICULTIES OF SHOPPING		ABSENTEES REFUSED SUNDAY WORK	
OTHER REASONS		PROVIDING COMPLETE INSURANCE SCHEMES	
		OTHER METHODS	

Firms answering BUSINESS questionnaire graded the "causes" and "cures" of absenteeism into first, second and third degrees of importance or effectiveness. The above charts show the proportion of replies in each case, the first choice in each case being marked solid black, the second white and the third dotted. In this case each individual reply was credited with one point

- ham, Bristol, Glasgow and Surrey.
- (b) One of these sources is malnutrition due to lack of correct food, fatiguing journeys, lack of time for shopping and bad cooking in canteens.
- (c) There is no longer any relation between hours of work and absenteeism. In the lowest returns of absenteeism are quite a number of firms working 68 hours (day shift) and 66 hours night shift), while firms working only 49 hours a week with no night shifts have, in many cases, absenteeism running round 12 per cent.
- (d) Another cause is lack of interest among workers between blitzes in the subject of output.

Aircraft Industry Figures Have Improved

The present questionnaire listed twelve possible causes of absenteeism. Directors receiving the questionnaire were asked to give the three chief causes in their own concerns and in the order of their importance.

Here are the results:—

Persistent overtime	21.25%
Seven-day week	15.00%
High rate of wages	14.2 %
Desire to avoid income tax	9.6 %
Visit of husband or friend	8.33%
Tiring journey to work	8.00%
Sunday work	6.25%
Lack of interest in work	4.58%
Difficulties of shopping	4.58%
Lack of Legal check on absentees	3.75%
Other reasons	4.46%
	100.00%

It will be noticed that persistent overtime is easily first with 21.25 per cent. It will be remembered that the

Ministry of Labour recommended a reduction of hours to 60 a week in July, 1940, with the hope that eventually hours could be reduced to 50/56.

As most employers know, this recommendation would have been given effect far more rapidly had not the Supply Departments pressed for longer hours to be maintained. During the present summer, however, the recommendation has been given wide effect. The beneficial results are seen in the fall of average overtime in aircraft and war factories.

Our reports say that whereas absenteeism was running at an average of 12 per cent. in aircraft factories a year ago, with quite a number rising to 15/20 per cent., the average level reported to us has now fallen to 6.8 per cent., as compared with 5 per cent. in other factories.

Short Hours Can Produce High Absentee Level, Too

The curious fact is that I can discover no conceivable relation between hours of work to-day and the incidence of absenteeism. Among factories reporting the lowest incidence of absenteeism (under 2 per cent.) there are three working 68 hours daily and 68 at night. Yet certain firms working only 48 to 49 hours shifts show figures of around 12 and 15 per cent, while firms working 48/54 hours per week report an average of absenteeism as high as 17 per cent. The most general percentage of absenteeism to-day (outside aircraft factories) is 7 per cent.

On the other hand, the highest figures for absenteeism practically all come from the great industrial centres of Birmingham, Bristol, Glasgow and the Surrey factory areas. There can be no question that heavy absenteeism

is partly a regional problem. The average for Bristol, for instance, is 10 per cent.; for Birmingham, 5.2 per cent. These figures are affected, however, by the coincidence that one small firm reported absenteeism of only .75 per cent. In the Hertfordshire factory areas, the average was 6.1 per cent.; in the Surrey factory areas, 5.8 per cent. The number of firms reporting in the Glasgow area shows the highest average in the whole of the country—10.75 per cent. More than one firm reported absenteeism of 15 per cent. This makes an average figure for the country of 5.84 per cent.

Three Facts For Government Departments To Ponder

In view of these figures it is urgent that the Government Departments concerned should begin to look at absenteeism as partly a regional problem. The reasons why it is bad in these cases, to judge from information received, are:—

- (a) A greater independence of outlook and a lesser degree of interest in the war among the workers. Partly this may be due to the time lag in the Shop Steward movement being stronger in the great cities and in the factory areas. Partly also it is due to a lack of propaganda for output by management.
- (b) Transport difficulties are at the maximum in the city factories, because so many workers have to come a considerable distance. In the factory areas of Hertfordshire and Surrey the transport difficulty is very acute because the workers are so widely scattered over country areas. Again this is a problem for

management to solve with the help of the Ministry of War Transport.

The time is rapidly coming when this Ministry will have to approach the War Office for the release of a few army lorries for these workers morning and evening. Why should the Army have thousands of lorries standing empty when the workers so urgently need transport?

- (c) The size of the factory in the city and in the factory areas is larger than in the average town. Absenteeism is a function of management efficiency. And the difficulty of securing happy employee relations in a great factory is many times that of securing good feeling and enthusiasm in a smaller factory. In this connection the article on the recent experiment by the Western Electric Company on page 15 should be studied.

Transport Facilities Must Be Improved

Returning to our questionnaire, it will be noticed that the seven-day week is regarded as the second major cause of absenteeism, securing 15 per cent. of the total. Elimination of Sunday work is one cure for this. It will be noticed that Sunday work now is responsible for only 6.25 per cent. of the absenteeism reported. The worker is apparently not opposed to Sunday work as such, indeed he welcomes it if he still has one day off in the week. A large number of concerns are now working five-week days and Sunday, or a six-day week without Sundays. It will be noticed that "Tiring journey to work" is responsible for 8 per cent. of the absenteeism reported. Since the war I have visited many factories where in peace time an adequate service was in existence, but to-day the service is completely inadequate in view of the number of people now working at these factories. The great control of vehicles by various Government departments is partly responsible. But to my mind, many managements have not been sufficiently aggressive in urging local transport companies to find more transport by hook or by crook.

Shopping Difficulties Can Be Overcome

Of the remaining causes we listed "Lack of interest in work" and "Difficulties of shopping" got 4.85 per cent. each. The first is dealt with elsewhere and the second has loomed significantly large in individual comments on the questionnaire. It will loom larger as more women are forced into factory work.

In a Middlesex factory it has been discovered that 92 per cent. of the women spend a considerable time in queues, while 96 per cent. of them find

the stores sold out of the goods they want.

One solution of this is to place orders in advance to be collected by the worker when they have been made up. Another is to compel shops to open in the lunch hour and for an hour or two later in the evening. It seems clear that these changes in shop hours must be made compulsory at an early date. Another solution is to allow the sale of unrationed goods in factories. This can only be done with the co-operation of the local shop-keepers. But with give and take, the idea might be used as a means to secure more practical hours of opening.

These Are The Most Effective Remedies

Much more important than causes are cures. Here BUSINESS was able to list 95.86 per cent. of the best tested and most reliable forms of easing industry's greatest disease.

Here are the returns:—

Cutting out Sunday work...	23.4 %
Reducing hours ...	22.09%
Having persistent absentees interviewed ...	13.75%
Absentees deprived of all overtime ...	13.33%
Supplying vitamins, medicines, etc.	10.42%
Keeping record of absentees ...	4.12%
Supplying more buses or coaches	3.33%
Absentees refused Sunday work	2.5 %
Change from piece rate to bonus	1.25%
Arranging hostels and other accommodation ...	.83%
Putting in a canteen ...	.42%
Providing complete insurance scheme ...	.42%
Other methods ...	1.14%
	100.000%

Since persistent overtime and the seven-day week were acknowledged to be the main causes of absenteeism, it is natural that a considerable number of firms should seek relief by removing the cause. Thus, by "Cutting out Sunday work" 23.4 per cent. of the absenteeism has been relieved, while "Reducing hours" has resulted in a further reduction of 22.09 per cent. These two methods may be termed "reliefs."

Punitive and Welfare "Cures" Both Produce Results

But with other firms, other methods were adopted to secure the desired results. Punitive methods, although not usually the policy of British industry in the twentieth century, have had to be used in certain cases.

The first step in this direction is, of course, the interviewing of persistent absentees. This method carries with it the threat of report to the Ministry of Labour and eventual prosecution in a Police Court. This has been found effective in 13.75 per cent. of the cases reported to us. In only a few cases has the recording of absentees had any effect.

Almost equally effective, and certainly more drastic, is the method of depriving absentees of all chance to work overtime, which is reported as

being used effectively in 13.33 per cent. of the total. With Sunday work largely wiped out, it does not figure high in our list. The actual figure is only 2.5 per cent.

As mentioned above, many firms recognise that malnutrition was one of the main causes for a large number of their workers being absent or listless at their work, although they listed other causes for the "preventable" absenteeism. With this knowledge, it is easy to understand why the supplying of vitamins and medicines should figure so high in our lists. Therefore, that this particular "cure" should rank fifth in our list with 10.42 per cent. shows that managers are alert to the medical problem created by malnutrition. Incidentally, considerably over twenty per cent. of all the firms who responded to our questionnaire gave the distribution of vitamins and medicines as one of their three known cures for absenteeism.

How the Question of Wage Level Affects Absenteeism

Only 1.25 per cent. of the total found that a change from piece work rate to a bonus scheme had a positive effect in checking absentees. None found the opposite, changing bonus scheme for piece work rate of any value. This confirms the view that it is the total amount of money that matters, not so much the exact manner in which the wage-package is made up. A large number of workers have fixed what they regard at the *maximum* amount of money they require on which to live. They have no desire to exceed this figure, especially as a large percentage of it would go in Income Tax if they did earn it.

Since canteens are now compulsory for firms of even small size, it is understandable that "Putting in a canteen" can now hardly be regarded as a "cure" and that the figure it scored, 0.42 per cent., is not a mistake.

Propaganda Can Give Short-term Relief

Under the title of "Other methods" we do get some enlightening ideas. Several firms have found the poster scheme described in BUSINESS, July, to be very effective for a short time in stirring up the enthusiasm of workers for their jobs. But, unlike the firm whose system we described, most of the firms seem to rely on Government-issued posters, which are allowed to stay up much longer than their usefulness calls for.

Another enlightening suggestion is that of preventing workers from earning overtime until they have completed a full week's normal work. This matches up fairly closely with suggestions made to us by others recently and is worth consideration. The experience of one concern with this idea will be published in October.



MANAGEMENT in War-time . . .

DIRECTORS of both nucleus and linked-up firms under concentration are facing entirely new management problems. One of the industries most advanced in its concentration plans is hosiery.

A week in Leicester provided some interesting side-lights on the new problems. While the nucleus firm is obviously faced by production complications in undertaking new lines for linked-up firms, the directors of such linked-up firms have to switch rapidly from the running of a complete business to the running of a mere sales organisation.

The changes involved are so extensive and the time given for adaptation so short that skill in management will be at a premium. Taking a typical instance, one hosiery concern has absorbed five others. The work previously done in six factories will now be done in one. Yet the production of all the multitude of lines required will employ fewer workers than were originally employed by the nucleus firm alone. Output also will be considerably reduced.

Concentration Cuts Out the Frills

HERE is an opportunity for the use of simplified practice with a vengeance. Impossible to make 120 lines with the machinery and floor space used for 20 before, except by increasing overheads savagely. The only way out will be to cut all unessential lines, and eliminate all frills and unnecessary details in order to give long runs and economic production. All this is going to call not simply for a mastery of production methods but even more for skill in convincing linked-up firms that some of their favourite lines can be sacrificed without ultimate loss of goodwill.

In this industry, a number of outstanding questions are being rapidly settled by the leading concerns. The Government asks the nucleus firm to work for the others "without profit." To my mind this is practically impossible. However, in the circumstances,

the material wasted (as a percentage always must be in production) will be sold as waste by the nucleus firm. An allowance will be made for the loss in manufacture due to moisture, the cost being included in the cost of the article to the linked-up firm.

A share of the total overheads of linked-up firms will include administration as well as production, being based, of course, strictly on production for the firm concerned. The linked-up firm will also be charged the exact cost of delivery to their warehouse or direct to the customer by the nucleus firm.

Each firm absorbed will pay its own war damage insurance on its plant and on that used on its behalf by the nucleus firm. Of course, each firm linked up will pay the cost of maintaining its plant put into store for the duration. No one has yet found a means of splitting any possible E.P.T. accruing to a nucleus firm as a result of an increase in turnover. In most cases, the firms linked up will keep their own salesmen on the road and their own sales organisations intact.

In most cases, the nucleus firm is putting a director of the linked-up firm on its own board. This sounds delightfully simple in theory, but it is going to mean quite a few difficulties in practice. For instance, each of the small firms linked up will necessarily acquire a very considerable knowledge of the production and sales practice of the nucleus firm.

In fact, some of the smaller firms are becoming quite philosophic about being concentrated. After all, they are relieved from all financial responsibility for the duration; they are assured a permanent market for their goods until after the war. They will be able to concentrate all their energies on planning their sales organisation and in cementing their goodwill with customers.

Eventually it is doubtful whether many of them will care to return to the arduous of competitive business against more powerful rivals. On the other hand, they may become increasingly important factors in the bigger nucleus

concerns, particularly if their designing and marketing skill is exceptional.

Common Sense Applied to Concentration

NOT the least of the ills resulting from concentration of non-essential industries is the interruption in the employment of many hundreds of workers. Even when they do find new jobs, workers who have been highly skilled in a "non-essential" industry frequently find that they cannot secure work that can make use of that skill, with resultant substantial drop in income.

A leading aircraft firm, which is taking over a number of the factory buildings which become available as their original occupiers are "telescoped", has adopted a common-sense scheme which has the dual effect of benefiting both themselves and the employees of the old firm. Under this plan a complete survey is made of the type of work carried on in the factory and where possible work of a somewhat similar nature is planned for that particular factory or section of the factory, when it is taken over. Thus, to quote an example, a silk stocking factory in the Home Counties was commandeered, but before the work of the hosiery firm ceased, an official of the aircraft company discovered that many of the girls who had attended the looms could easily adapt themselves and their knowledge of intricate machinery to that of automatic lathes used for aircraft production work.

Accordingly, except for the short space of time required to move the hosiery plant and instal the aircraft machinery, employment for several hundreds of girls went on uninterrupted. The advantages to the aircraft firm were many. First, they had a full complement of workers with a considerable degree of mechanical efficiency. But much more important was the fact that their personnel, having already worked together for some years, were already imbued with the "team spirit."

Building a Small Business on Ford Lines

HOW is the small business to weather the war-time storm? Everything depends on how that small business has been organised to meet the pre-war situation of combine, monopoly and heavy taxation. Few small (5-25 men) concerns were so organised before the Great War.

Clearly a small factor in the '20's was "in peril on the sea" of fast growing manufacturing houses, combines, chain stores and cut-throat competition.

Henry Ford's great book, *My Life and Work*, came into my hands at this juncture. It seemed impossible to believe that a wholesale stationery business could be revolutionized on Ford lines of manufacture and distribution, but something had to be done: so I determined to try at least some of the Ford methods.

Personal Problems That Had To Be Faced

I had been trained in a factoring business. My father's outlook had been all against manufacturing. It must be conceded that he had been right for his time. But we now had to decide that manufacturing was the only hope for the future. If we attempted it on our small resources it must be done on new methods.

We therefore concluded we should have to face *seven major problems*.

- (1) We must have our own factory built for the job.
- (2) We must have the machinery, about which we knew little or nothing.
- (3) We must create and train a labour force which was unique in personal enthusiasm to get the economies from mass production on a small scale. That force to be tip-top and fighting keen.
- (4) We must create a new market for what was already a highly competitive line, commercial envelopes. Selling direct to the consumer seemed the only outlet for the heavy production visualized.
- (5) We had to find a method of selling which, whilst retaining all the personality so essential to modern selling, did not involve the money and time involved in personal travelling. Personal contact with prospects is a tremendous business builder, but it has this important fault, that should the individual fail to function for any reason, the goodwill built by that means is difficult to retain. There is a risk of large slices of business falling away at critical periods.
- (6) We had to face these issues on limited financial resources.
- (7) We must so plan all these sides together that we should be in a position to extend rapidly and yet

Mass Production Methods can be Successfully Adapted to Meet the Requirements of Firms with only a few dozen employees

By LEWIS EAST,

Managing Director, Lewis East & Company

maintain all the individual contact with workers and customers that were an essential part of our whole policy.

I deal with these problems in order.

A Lucky Find For a New Factory Building

We had very little money in those days, and we had to move cautiously. I had drawn a plan of what I considered the minimum size and type of building required many years previously. This was dug out, and with slight amendments met the needs so far as I could visualize them. An architect's estimate for the building was our first obstacle, much too heavy in cost.

I therefore looked round for another way of dealing with it, and decided on erection by direct labour under my own supervision. Where to get materials cheaply was the first question. I solved it by going to a demolition contractor working on a big job. I showed the foreman my factory plans. He looked quite astonished for some reason, and took me over to a small building not yet demolished.

"Look here. This is your factory" he said. It was my plan, foot for foot, window for window, door for door. I quickly bought the building, and had it transported and re-erected by direct labour.

Personal Experience Helps Workers and Machines

Of course, I know nothing about constructional work. No doubt I was "had for a mug" a dozen times, but it was a fascinating job to handle, and we built for less than half the architect's estimates. From this small building of about 1,500 square feet, we could turn out many millions of envelopes every year. We left room for expansion in the future, and we have needed it.

The next move was to purchase a second-hand envelope machine. We found one in a scrap yard, and I spent eighteen months learning its vagaries, doctoring it into production, and

improving its speed. We could have employed an expert to teach us how to run it, and to overhaul it, but I had determined it was essential to understand the machine by *personal experience*. How else could I appreciate the workers' difficulties and point of view?

We did *once* employ an expert's advice *after* we had established our own methods. We offered a fee for a widely skilled technician to visit us and check up, and to advise any improvements he could. He reported that in twenty years' experience of envelope machines in many factories, he had never seen such production figures as we were getting, and refused to accept his fee.

The old second-hand machinery has long ago been sold off, and the most modern plant replaced it. If new machines are designed which give better production figures, we scrap the old ones, *even if they are almost new*.

The Seven Tenets of Successful Business Building

A machine which is producing 10% less than the latest type of plant is a 10% tax on the business. To hang on to it because it has not been written off, or because it still has years of life in it, is just false economy.

From the first I adopted flow production. No, you needn't smile! Flow production is just as helpful in a factory with nine workers as in one with 900. But all this care of machines and layout would not, of itself, give us the economical output. We had to train a new staff, and we have a grand team.

As I suggested in July BUSINESS I have always had a definite labour policy. It is very simple, but it rules out the old attitude of treating employees as "Labour." I decided on the following main points.

- (1) The old fashioned Christian attitude of 'do unto others as you would have them do to you' ought to be workable. But none of the old humbug will fool workers these days. A silk hat on the Sabbath and a name high in every sub-

(Please turn to page 14).

Use the New Machinery for Overcoming Shortages - Bottlenecks - Overloading - Red Tape

THE Government has set up local organisations for dealing with shortages, over-loading, bottlenecks and production difficulties generally. These Regional Boards avoid red tape and cut some of the tangles already existing, and all they ask is to be used.

The speed of war production is no longer impeded by shortage of orders. Vast contracts have been let out, which are sufficient to keep industry fully employed. Our present task is to spread out the work so that every idle machine is put into full employment: to see that no hour of machine time nor any foot of factory floor space is wasted. The Regional Boards have been created to do just this. Their special duty is to see that every machine tool, every factory and every man available is used for the production of munitions and war materials.

Filling in Spare Hours In Output Capacity

The most interesting service of each Board is its capacity exchange, organised by the Secretary and where necessary, carried out by subordinate clearing centres covering a single town or county. It is the job of this exchange to see that any spare hour on urgently needed machines is filled up. They try to put every firm that comes to them with a request for productive capacity, however small or however large, into touch with the firm or firms which can offer it, either in their own region or in another part of the country.

Men and Machines Will Be Available

The method of action is quite simple. Every Regional Board's Secretary is ready to receive from the management of any firm in the region such requests for, and offers of, capacity. For example, one concern may have a jig borer which is going to be idle next week, while another firm, 10 miles away, may be urgently in need of a few days' work from such a machine to relieve a bottleneck in its production flow. The job will be done for the second firm by the otherwise idle machine of the first. *The Board's staff includes practical men with technical experience, who can link up the idle capacity of one firm to relieve the over-loading of another.* One firm may have temporarily idle capacity for heat treatment which another firm urgently requires. Such a job will be arranged by these "technical officers."

So if you find yourself with any idle capacity, don't complain. Get in touch with your Regional Board right away.

The other side of the picture must not be forgotten however. If you want extra hours on a jig borer or on any other machine, if you want to put out work of any sort and your ordinary contacts fail you, *your Regional Board are ready to comb the country for you if you will give them immediate advice.*

There was never any red tape about the work of the Area Boards, and this tradition is maintained by the Production Executive. *The officers handling this work are mostly principals in their own area; they are expected to act quickly and independently upon their own initiative.*

Time Saving is Important Factor in the Scheme

These Regional Boards, if properly used, render one further service. They save time. The official members are each responsible to their own Departments. This means that any complaints or suggestions relating to war production can be reported from the Board direct to the proper Department with the backing of responsible local officials. This cuts out the delay caused

by each Department referring the matter back to its local officials.

In addition to this co-ordination of production effort, the Board advises the Regional Controller on the problem of providing and allocating factory accommodation; it co-operates with the Emergency Repairs Department of the M.O.W. & B. in connection with the repair of air raid damage; it brings to the attention of the Regional Transport Commissioner any transport difficulties whether these affect workers or goods, submits proposals for their solution and co-operates with him in any action by which they can be quickly removed.

Help For Overcoming Material and Labour Shortages

It assists in securing raw materials for the local concerns from the various Departments involved, and it assists you to secure additional labour where possible, to deal with problems of reserved workers and to secure the best training for young workers.

Further, each Board maintains close contact with the Regional Commissioner, with the Emergency Service Organisation for dealing with damage after air attack, the Regional Controller of Factory and Storage Premises, the Divisional Coal Officer and the Gas and Electrical Supply Companies.

A list of the eleven Regional Offices may be obtained from the offices of the Production Executive, Great George Street, London, S.W.1.

Building a Small Business on Ford Lines

(Continued from page 13)

scription list cuts no ice if the worker's pay packet is light, and his job heavy.

- (2) There must be a determination to cut out both overtime and short time. Security is the average worker's greatest need. In the past eight years I do not think we have had six weeks of short time, and that due to war conditions we could not control.
- Our policy proved so successful from the outset that we could not keep pace with the business. We aimed at 52 weeks' pay in the year and achieved it by making for stock over our three months' quiet period.
- (3) I pay for holidays, and have done so for years.
- (4) Reasonable time off for personal reasons is paid in full. The worker is a partner in the business.
- (5) Workers away sick are paid in full for at least the first week. Afterwards we make up National Health Insurance to the full week's pay.
- (6) A five day week was aimed at; we did not achieve it for some time; but we felt that a hard worked five day week was enough.
- (7) I felt that a family atmosphere

could prevail with great gain to efficiency. A joke and a smile, an easy attitude are not incompatible with authority.

All this is very simple and it seems to work. We have the finest staff anyone could desire, and no one ever takes advantage.

Ford asserts that his principle of business can be applied to any industry with equal success. I set out to test that theory and adapted to so different a field as envelope manufacture. It has resulted (until the war) in rapidly expanding turnover and profits. Ford principles interpreted to our needs did not fail us.

How can one preserve all this in War-time? Given a modernised one-line, mass producing, direct selling business, I believe one's course in war time is clear.

Business difficulties will increase further before this war is won. After the war, there will be an outcry for every sort of goods. Here again, unless customers can be kept at least partially supplied, the goodwill of small businesses will disappear overnight.

A New Approach to Labour Relations—

Why did *Worse* Conditions Make These Girls Work Harder?

CERTAIN quite revolutionary discoveries on labour relations flow from a number of independent researches in the United States. Indeed a completely new approach to the whole problem has been discovered. It is worth while to record these findings in some detail, as the vital reports are only obtainable in the United States during the war.

In looking at American experience in labour relations a number of factors have to be borne in mind. Millions of American workers are the children of immigrant parents from Poland, Russia, Italy, Scandinavia and other European lands. They are uneducated and fundamentally suspicious as well as democratic, keen and ambitious.

Next, while American management has taught us an immense amount about mass production, factory management, time and motion study, we are ahead in almost every branch of sociology, personnel management and factory hygiene. Nor do we now suffer from the keen sense of a class struggle still existing in a country where unions have barely yet gained complete recognition, where the employer is still intensely individualistic, where the police are suspected to be the paid hirelings of management.

An Epoch-Making Report on Management

All these factors mean just this. Neither management nor worker are so combative here as in America. War conditions have further released this management-worker tension over here so that any results to be obtained from a new method of approach are unlikely to be so startling here as there.

Allowing for all this, these new experiments must influence management methods and attitudes to labour profoundly. Indeed, I regard the final report* on the experiments (1924-1938) at the Hawthorne plant of the Western Electric Company as the most important book on management published since Henry Ford's *My Life and Work*.

Western Electric is regarded as one of the best managed of the great American undertakings. Its employment roll is normally over 25,000 people, of sixty nationalities. It has its Industrial Relations branch corresponding to our Welfare Department, its saving schemes, loan association, accident insurance, social and athletic clubs,

This is what happened during the Hawthorne Experiments of the Western Electric Co. (1924-38). Most far-reaching report on management since Ford's "My Life and Work" is here discussed in detail. These startling conclusions will profoundly influence personnel management in this country

with playing fields and gymnasia and a full medical service, including a private hospital.

For these reasons it is more in line with the best British industrial concern than many other American businesses.

Lighting Controlled the First Experiments

In 1924, the Western Electric, with the co-operation of the Industrial Research Department of Harvard University and others, began a series of enquiries into the effect of working conditions on output which led to revolutionary conclusions. Normally the physical conditions affecting output are regarded as general conditions of work, seating, lighting and hours of work. The first experiment dealt with lighting. It tried to discover what the optimum lighting on various jobs might be in view of the output obtained under various degrees of illumination.

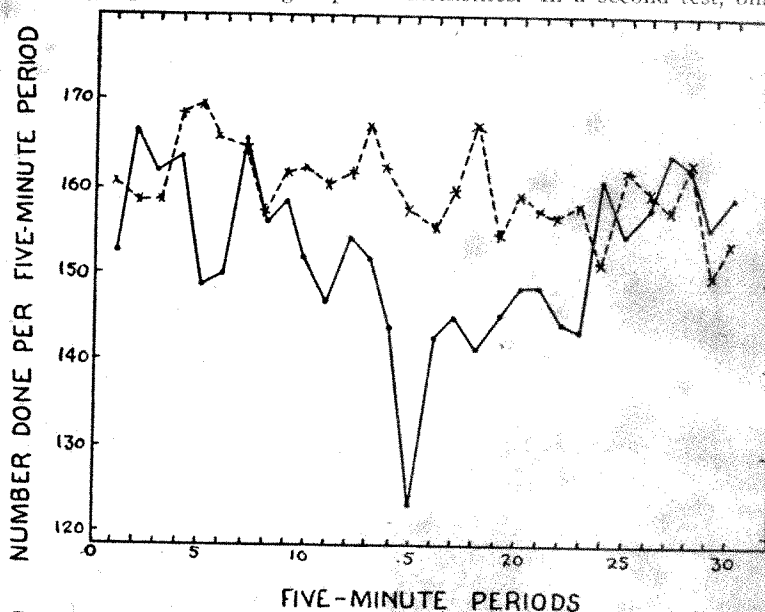
For this purpose a test group of

workers was kept under a constant amount of light, while a second group was gradually given more light. Both groups were working on winding small induction coils on wooden spools. They worked in different buildings, so that the spirit of competition was avoided.

While the control group worked under a more or less controlled level of 16/20 foot-candles, the test group worked under three different intensities of light, 24, 46 and 70 foot candles. The output of the test group rose with the amount of light. But so did the output of the control group. Indeed the difference in the outputs of the two groups was completely negligible.

The First Signs of Steady Output Increase

The question then arose as to whether natural sun-light had prevented definite control of the illumination intensities. In a second test, only arti-



Curves show rate of working when (a) boredom was prominent and mind-wandering almost absent (continuous line), and (b) when boredom was slight and mind-wandering prominent (broken line). Reproduced from *Industrial Research Fatigue Board, Report No. 50*, by S. Wyatt, J. A. Fraser and F. G. L. Stock, by permission of Controller, H.M. Stationery Office.

**Management and the Worker*, by F. J. Roethlisberger and William J. Dickson, (Harvard University Press, U.S.).

RECORD OF 114 WEEKS OUTPUT IN RELAY ASSEMBLY TEST ROOM

Period	Length in weeks	Experimental Conditions of Work	Experimental Working Hours per week	% Decrease from Standard Working Hours	Output
I	2	Standard	48	—	2,400 units per week
II	5	Standard	48	—	2,400 units per week
III	8	Standard	48	—	Output up
IV	5	Two 5-min. rests	47.05	1.9	Output level
V	4	Two 10-min. rests	46.10	3.8	Output sharply up
VI	4	Six 5-min. rests	45.15	5.7	Output down slightly
VII	11	15-min. a.m. rest and lunch 10-min. p.m. rest	45.40	4.8	Output up
VIII	7	Same as VII, but 4.30 stop	43.10	10.0	Output sharply up
IX	4	Same as VII, but 4.00 stop	40.40	15.3	Weekly output level; hourly output up
X	12	Same as VII	45.40	4.8	Weekly output up; hourly output down
XI	9	Same as VII, but Sat. a.m. off	41.40	13.2	Output level
XII	12	Standard	48	—	Output up new high level for every worker.
XIII	31	Same as VII	45.40	4.8	Weekly and hourly output sharply up, 3,000 units per week.

ficial light was used. The control group was provided with a level of 10 foot-candles while the test group was provided with intensity levels of 10—3 foot-candles, with steps decreasing one foot-candle at a time.

I give the extraordinary result in the precise words of the scientist reporting.

After the level of illumination in the test group changed to a lower level, the efficiency of both the test and control groups increased slowly but steadily. Directly the level of the illumination for the test group reached 3 foot-candles the operatives protested saying they were hardly able to see what they were doing, but the operatives could and did maintain their efficiency to this point in spite of the discomfort and handicap of insufficient illumination.

In a third experiment two capable operatives kept up their output when the light was cut down in their room to 0.06 of a foot-candle or that of a normal moonlight night.

Increase in Illumination Popular with Workers

Finally the two original groups were again used to check up on the previous experiments.

First, the amount of light was increased regularly day by day. The girls said they liked the brighter lights. For a day or two the electrician merely took out bulbs of a certain size and inserted bulbs of identical size without in any way changing the amount of light. Again the girls were delighted about the increase of light.

After several days the experimenter started to reduce the intensity of light. Again the girls complained about the lesser light not being so pleasant to work under on days when the elec-

trician had made no change whatever in candle power.

Actually output never changed on any day of this experiment.

It was this preliminary series of experiments on lighting that suggested to those concerned that there was something more important to factory workers on a delicate, eye-straining job than even a good light. What was it?

Rest Pauses Lead to Sharp Step-up in Output

Clearly the answer demanded further experiments on a larger scale but better controlled, more closely observed. It was decided to isolate a small group of girls working on relay assembly (of about 35 small parts) in a small room where their *behaviour* as well as their work could be studied and recorded systematically. With the girls was an observer from the research staff to record results and to maintain a friendly atmosphere.

The girls were told about the experiment, asked to work normally, encouraged to give the observer their genuine comments, ideas and complaints.

It was decided to test on this group the effects of a variety of working hours and of rest pauses. Both quantity and quality of output can be easily tested in a simple assembly job of this type, the latter by the amount of repair work caused in process or by inspection. Output would naturally be the criterion. A change in hours or other conditions that increased output would be good, a change that reduced output would be bad.

For a fortnight the girls continued to work in their old shop on a 48

hour week, including Saturdays.

For another five weeks they worked under exactly the same conditions in the new Relay Assembly Test Room. Output was around 2,400 relays a week.

Next piece-work rates, worked out to allow for the cost of one lay-out-operator required, and to give a greater incentive to individual effort than existed in the group payment system used in the shop were used. Output went up and stayed up during eight weeks.

Now two rest pauses of five minutes each were introduced. Output was not affected.

Rest pauses were now doubled to ten minutes. Output rose sharply.

Six pauses of five minutes each were now tried. The girls complained that they were always starting and stopping. Output fell slightly.

Output Again Jumps Up With Shortened Hours

Two rest pauses were next introduced. During the morning pause of fifteen minutes a lunch was provided by the company, while the afternoon pause was ten minutes. Output rose.

Next the working day was cut short at 4.30 instead of 5, rest pauses remaining as before. Output rose sharply.

When the working day was cut by another half-hour (closing 4 p.m.), daily output remained level, while hourly output rose.

After that, hours went back to normal, closing at 5. Weekly output rose sharply, although hourly output fell.

Finally all rest pauses were removed, the working week was restored to the

full 48 hours, luncheon was stopped. Again output *rose*, touching 3,000 relays a week per girl. Hourly output fell.

Nor was this all. The *quality* of the work also improved. For the average time spent by each girl on repair work (sometimes due to a faulty part) fell from 14.9 minutes per week in the third period to 13.4 minutes in the second last period and 14.4 in the last. Time taken for personal absences also fell from 10.5 minutes a day in the third period to 7 minutes a day in the last. Absences fell from an average of 15.2 days a year to 3.5 days throughout the 114 weeks of continuous test.

Improved Working Conditions Founded Team Spirit

What had happened? Each of the girls concerned had become *interested* in the firm, the experiment, her fellow workers. Each felt herself a member of a social group. That is normal: every worker finds his own group in the factory. This group was remarkable in gradually becoming less and less suspicious of the management, less and less "ca-canny", more and more a good team, with all that implies.

Most astonishing of all the results in some ways was the banishing of normal fatigue. Every manager knows the deadly effect of cumulative fatigue on the average human being. Interest flags, attention wanders, pace slackens while the sense of effort lowers the spirits.

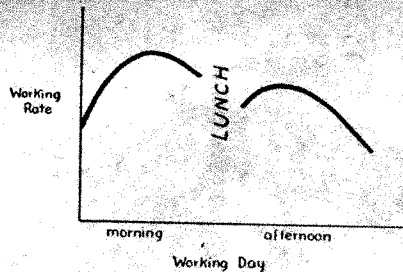
Six Unheard-of Results of Two-Year Tests

The rest pause is a largely British device to reduce fatigue. We owe much to the experiments on this subject of Prof. Sargent Florence, Burr, Myers. I give on page 15 Burr's classic curve for a normal day's work curve and the Industrial Fatigue Research Board's curves on the effects of boredom on the repetition worker.

Naturally the *fatigue* curve varies according to whether the job entails heavy muscular work, merely skill and dexterity, or whether a rhythmic movement is possible. Curve 1 is typical of the heavy muscular job, curve 2 of light repetition work.

Work curves for individuals experiencing monotony in their work are described by Myers as being characterised by (1) a drop in the rate of work in the middle of the spell, (2) an increased variability in the rate of work, and (3) a tendency for the rate of work to increase at the end of the work spell. This tendency is called "end spurt" and is said to be due to the relief experienced in realising that the work is about over.

Commenting on work curves having these characteristics, Viteles said, "The significant fact is that such changes in the rate and variability of production, represented by a change in the shape of the work curve, appear only in the case of workers who



The typical daily work curve for a monotonous job. Reproduced from H. E. Burr's *Psychology and Efficiency*, by courtesy of D. Appleton-Century Co.

express boredom and dissatisfaction with repetitive work."

Clearly this Hawthorne test falls naturally into the category of monotonous repetition work. We should expect an output curve between the two shown in Figure 2.

We should expect that output would be lower in the last three days of the week due to an accumulation of fatigue. We should expect periods 2 and 3 (before rest pauses were introduced) to show the greatest decline in the rate of work.

In fact the following and hitherto unheard-of results appeared:—

- Between Mondays and Fridays the output rates of these girls were practically constant.
- Minor variations adhered to no general pattern: sometimes the output was changed on a Tuesday, at other times on a Friday.
- While output was relatively low on Saturday, it was also relatively low on Monday.
- In periods 2 and 3 the morning output exceeded the afternoon by

3.3 per cent., in periods 8 and 9 this dropped to an average of 0.3 per cent. In period 12, when working conditions were relatively adverse, the average again rose to 2.9 per cent.

- In periods 4 and 5, the average percentage between morning and afternoon was 3.9 per cent. (with rest pauses) whereas it was about 3.3 per cent. in periods 2 and 3. The explanation that the rest pauses had not been long enough scarcely held good, since no serious change occurred when they were lengthened.
- When rest pauses were restored, the afternoon rate of output actually exceeded morning output by an average of 1.6 per cent. Four operatives out of the five did more in the afternoon than in the morning.

Good Conditions Immunised Workers Against Fatigue

If these results mean anything, they show that ordinary fatigue was not felt by these workers for some eighteen months, except when rest pauses and other privileges were temporarily withdrawn.

Indeed the facts admit of no other explanation, since the experiments covered over two years. In fact, interest in the work, a sense of personal importance, the feeling of having found a niche of her own, had apparently immunised each of these workers from the effects of fatigue.

It was on this hypothesis that the next Hawthorne experiments were undertaken.

(To be continued).

TWIN SHIFTS

A Revolution in Working Hours

A WEEK-END consisting of 72 hours! Twenty-four hours free every other day! How would such a system affect your output? How do employees like it?

These questions can be answered from experience by at least two manufacturing firms who have put the system to the test. This is how they have worked it.

Workers are divided into two sets, each of which spends twenty-four hours in the factory and twenty-four hours away from it.

Travelling in Peak Traffic Periods is Obviated

By one method, which has worked very well, the twenty-four hour period begins and ends at 10 a.m. This means that employees are not travelling to and from their work during peak traffic hours, nor through the after dark barrage, and they make only half the normal number of journeys.

Work goes on till 6.30 p.m., with breaks for meals. From 6.30 p.m. to 12.30 a.m. there is a rest period, and

then the workers carry on till 10 the next morning, when they are free for twenty-four hours, while the second set of workers take their place.

Deep A.R.P. shelters fitted with bunks are provided, and all meals are obtainable on the premises, during work and rest periods.

This System Gives a 3-day Weekend Break

Firms employing this method find that employees, at any rate in wartime, take kindly to the idea. They like the long free time and they are glad not to have to travel during danger. Another great advantage which they welcome is that this system gives them a clear break of 72 hours every other week-end.

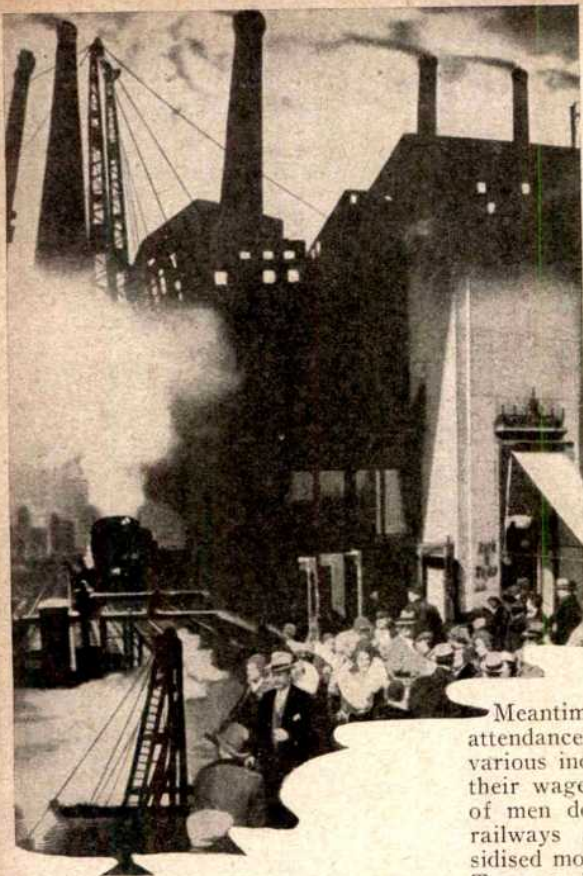
From the management's point of view, this system enables the plant to be used to capacity, as they are able to employ a third lot of shift workers during the 6.30 to 12.30 evening period when the two other shifts have their rest.

TREND OF TRADE

Inflation is a Present Peril, Not a Bogey

Says CECIL CHISHOLM, M.A.,

Business Consultant



THE fall in shop sales by 10.3% is significant. It proves that the effect of the rationing of clothing was entirely responsible for the good sales figures in June. Indeed, the decrease in non-food sales was more than twice that for food and perishables, a sharp contrast to the small decreases and occasional increases recorded in earlier months of the year. Yet sales in July 1940 were already low, 17 per cent. below July 1939. Rationing is putting a brake on the sale of clothing with a vengeance.

The decrease in non-food sales is over 20 per cent. for both piece goods and women's wear; 15 per cent. for men's and boys' wear and 10 per cent. for boots and shoes and fancy goods. The fall in sales is more evenly distributed over the areas than usual. The only exception is Scotland where the sale of piece goods actually rose by 1.5 per cent. and that of household goods by 12.8 per cent.

Yet the trend of sales is higher in July than in June. So that war-time conditions have entirely reversed normal trend,—a fall in sales during July.

State Subsidies Will Not Prevent Inflation

NOW if prices are up at around 60 per cent. wages are up by about 22 per cent., with only 50 per cent. of the pre-war supplies of goods available. It is clear that inflation is a quite present peril, and not a theoretic bogey. The one solution to this problem is to put a salient to wages. Mr. Bevin apparently believes that this can be

done if the Government can stabilise prices. Personally, I agree with Mr. Bevin's Union, which says that prices are not and cannot be stabilised. (I would add, unless wages are stabilised). Meantime, the miners have their attendance bonus, women workers in various industries are seeking to bring their wages more into line with those of men doing similar work; and the railways are apparently to be subsidised more liberally than ever. If the Treasury imagines that it can stabilise prices merely by subsidies, it will quickly find it is another bend of the vicious spiral. For who is to decide on the size of the subsidies which each price-controlled industry will demand?

Will Burden of Post-War Debt Be Bearable?

A FEW responsible people consider that "controlled" inflation may be a benefit. ("Controlled" inflation is, of course, already here. It is uncontrolled inflation that one fears). These people argue that only a dose of inflation will enable us to pay the cost of the war.

A survey which the "Economist" has made of the cost of the present war to date, does not support this theory. On the contrary, it suggests that the cheap money policy of the Government should make the burden of post-war debt bearable.

The reasons for this are clear. First, the Treasury is paying little more than half as much for money. Secondly, the proportion of expenditure left as debt is much smaller in this war. Thirdly, our greatest creditor in the last war, the United States, is now lending or leasing us the goods we require.

Finally, the debt was incurred with wholesale prices running as high as 135 per cent. (1918) and 145 per cent. (1919) above pre-war levels. But prices very soon settled down to around 50 per cent. above pre-war level. The *Economist* concludes that this rise in prices will be prevented, a reasonable supposition in view of present experience.

At our present rate of increasing expenditure, the war would cost around £10,000 million if it lasted as long as the last. At the current rate of interest (under 2 per cent) this would cost (nett) £150 million a year or around 1/6d. in the pound.

What I think the *Economist* does not offset sufficiently is the probable increase in the cost of the social services.

How Export Will Help Now And After the War

ONE method of easing post war taxation will be to increase exports. But shall we have materials to make the goods, ships to carry them—most important of all—and shall we have the markets? Certainly war conditions are cramping our export style. Changes in the export policy forced on the Government by the logic of events are crippling the efforts of the manufacturer. I outlined the new policy (the fourth phase of our war-time export policy) in June. Since then certain new factors have got to work, noticeably the inevitable results of the Lease-Lend Act.

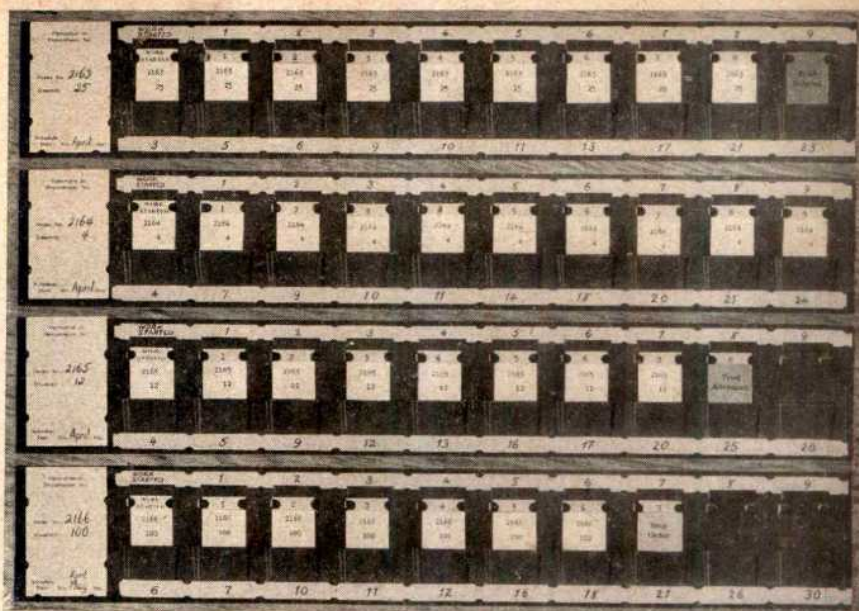
Very briefly, the effects of the changes are these:—

- (a) The conversion value of goods for export is again vital. Clearly we cannot export America's precious steel unless it has been fabricated into a really valuable product.
- (b) Our situation *vis-a-vis* Canada is delicate. America has always regarded Canada as essentially her market.
- (c) Finally, lack of sterling continues to operate against purchases by all the Latin American republics except Argentina and Uruguay.

There are cases, however, in which a case can be made to the Board of Trade for special consideration. For instance, Japan is simply eating up the South African market. There is a case for the granting of licences, the finding of shipping space for exports needed to maintain a hold against Japan.

Finally, care has been taken to keep firms going in most of the branches of the concentrated industries that make distinctive specialities for export.

A simple progress board using the actual job cards to indicate the exact state of production of any unit in course of manufacture or assembly



This System Gives Production, Progress and Pay-Roll Control on One Card

DEVELOPED from an idea that has been successfully employed in the tailoring trade over a period of years is a production control system just introduced in a number of engineering works engaged on intricate Government contracts.

Costing and progress control are, as in all branches of engineering, matters on which the greatest detail and much time have to be spent. But, by the use of this system all the individual operation tickets and the master ticket covering the whole job or unit can be produced, with all the essential details, in one operation.

Basically, the system provides a separate ticket for each individual operation, all these operation tickets forming part of the master ticket from which they are detached as work on

Simultaneous preparation of job tickets gives a complete method of stock and progress record, as well as wage-costing control

each section of the job is handled. The machine which imprints all the necessary details on these tickets is controlled by six or twelve sliding handles, according to the amount of information required on the ticket, and the actual printing is done by a single operation of a lever.

Full Details of Wage Costing Is Given on Job Card

All details of the piece-work rate to be paid for each operation, or the time-work (minutes to units) value of each operation or the time

such operation should take, can be shown. In the case of piece-work, the actual price is shown in clear figures. When the operation is of a pre-determined sterling value, but the operator is on a time rate, the value is then expressed by a code letter.

On receipt of an order, together with the drawing or blueprint, and the pre-arranged schedule of operations, the master job ticket for the component to be made is prepared before any instructions are issued to the works.

In the example shown in the illustration below, only eight operations are needed for the completion of the job,

Order No.	Dwg. No.	Detail	Quantity	M/c. No.	Mat. Desc.	Mat. Qty.	Op. No.	Op. Desc.	Op. Qty.	Op. Price	Op. Time	Op. Rate	Op. Value
1234	AF102	Detail	15	55	Bore. Face, Screw Long Hole	9.00	1	Op. 1—Lab. Grade D	15	15.00	37 mins.	15.00	15.00
1234	AF102	Detail	15	55	Mill 4—11 Flange	3.30	2	Special Jaws T.1356	15	15.00	25 "	15.00	15.00
1234	AF102	Detail	15	55	Face 1" Cash	1.00	3	Pilot Bush T.1349	15	15.00	75 "	15.00	15.00
1234	AF102	Detail	15	55	Burr.	16.00	4	Pilot Boring Bar T.135	15	15.00	56 "	15.00	15.00
1234	AF102	Detail	15	55	Code Comp.	15	5	Boring Tool " /1	15	15.00	38 "	15.00	15.00
1234	AF102	Detail	15	55	Code Comp.	15	6	" " " /2	15	15.00			
1234	AF102	Detail	15	55	Code Comp.	15	7	" " " /3	15	15.00			
1234	AF102	Detail	15	55	Code Comp.	15	8	Std. Tool Post Facing Tool S.98	15	15.00			
1234	AF102	Detail	15	55	Code Comp.	15	9	Op. 2—Lab. Grade C Mill Cutter	15	15.00			

A typical job ticket for use with this system of production control. The master section on right is printed, with details of the various tasks, in one operation with the remainder of the ticket

but tickets are made to cover, if necessary, up to seventy different operations on a single job ticket. The individual operation tickets each contain order number, drawing number, detail (part or item number), quantity, machine number, and the particular operation concerned, each operation ticket being numbered in consecutive order in accordance with the sequence of operation.

The figures below the description of the operation represent the time in hours and minutes that the operation should take. In place of these figures, there can be a code used indicating such elapsed time or the minutes to units value. Furthermore, where piece-work is involved, the piece-work rate for each operation is shown in clear figures, thus indicating the amount to which the piece-worker is entitled on completion of the operation.

How The Progress Board is Designed

It will be seen that the information on the first five lines of the sectional tickets is the same throughout, and is repeated on every sectional ticket. The particulars given are those usually required, but other information can be recorded, and the sizes of the sectional tickets can be planned to meet the requirements of the job.

The tickets marked "P" are detached from the master job ticket along the perforation lines, and are used for planning.

The planning department decides not only the route but the time-table, machines to be used, and the supply of requisite materials and any special tools required. The progress department will see that these decisions are carried out.

Use of Master Ticket Prevents Production Bottlenecks

The top portion of the master ticket, that is, the section containing the operation tickets, is also filed in chronological order in accordance with the production date, i.e. date job is on the machine for the first operation. At this stage there can thus be seen the planning positions of each machine and the works order awaiting release to that machine. The load on every machine is indicated, so "bottlenecks" are prevented.

Towards the right hand side of the master ticket is seen a section with "material due" and "material issued" thereon. This stores requisition ticket is passed to the stores for the release of the material required. Below the requisition ticket is seen the allocation ticket which is ultimately filled in when the finished components are received. A list of tools and jigs required can also be incorporated, as shown—the ticket being extended in length if necessary to allow for further details being included.

(Please turn to page 34).

Editorial

The Office Needs Its

Vital Machine Tools

"We must on no account interfere with the complete record of information relating to production. This is entirely essential to the efficient conduct of our programme."

THE speaker is Lord Beaverbrook, ace energiser. The occasion is an effort to cut out red tape at the Ministry of Supply. Countless Government forms and returns must go, but complete, up-to-the-minute records must remain.

How are these "complete records of information relating to production" to be obtained quickly and accurately? It can only be done by the use of the most modern systems and machinery for collecting, collating and classifying day-to-day statistics of output and other work.

But this job of complete recording is vital for every one of the 15,000 industrial concerns working on Ministry of Aircraft Production, Admiralty and Ministry of Supply contracts. So far the Government have merely recognised that these systems are vital to the handful of concerns directly controlled and who thus have access to Government priorities in office machines and equipment.

Yet how much of the loss of production due to lack of co-ordination, is actually the result of inadequate figures, inadequately presented?

The presentation of the necessary facts quickly, logically and accurately arrests attention and stimulates action. With modern administrative systems, as with modern advertising, it may be said that everything is designed first to arrest attention, next to sell an idea and thirdly to generate action.

There is little evidence so far that the Government realises this. Modern administrative systems and equipment are an integral part of the mechanism of production. These products are as vital to rapid and efficient production as machine tools.

There are few instances of hold-ups or of bottlenecks in which incomplete, inadequate, or late records have not played a part. For instance, a key

airplane manufacturer recently subcontracted a considerable quantity of machine shop work. Some weeks later they discovered that their own shops would shortly be starved for work.

On investigation it was clear that the method of allocating and reflecting the machine shop loads was inadequate. They failed completely to present to the executives concerned an action-compelling picture of the true potentials and the actual loads.

Another source of hold-up is the failure to keep component parts manufacture in step. There are, for instance, enough valves to complete an engine programme three months ahead, but not enough gear wheels to complete a programme due the previous month. The final engine output is determined by the smallest individual quantity of any constituent part. Each factory has its own complexities of material supplies, component stocks, machine shop loads and so forth. But in the last 20 years, ingenious methods have been devised, tested and improved, so that they can tackle the most complicated of these programmes without risk of error.

It is vital to the war effort that access to the most modern administrative methods and control systems should be simplified. Now that the Government has set up a Directorate of Office Machinery we hope that it will envisage the whole problem. That problem is not merely the rationing of available stocks, but recognition that efficiency in production can be increased by providing the systems that will stimulate normal human beings to anticipate and act—above all—to act!

We cannot fight the war to a victorious issue with "bow and arrow" minds. Nor can we successfully control our unexampled industrial effort with "penny exercise book" methods.

We look to the new Directorate of Office Machinery to realise the fundamentals of the problem and to press the issue with the Government Departments who alone can sanction its solution.

SIMPLIFIED SYSTEMS • SAVING MATERIALS • FOOLPROOF METHODS

BUSINESS

Annual Survey

OF

Administrative Equipment

FOR

FACTORY, SALES & GENERAL OFFICES

We take pleasure in presenting an even more complete survey of Office Equipment this year than last. In every field of administration there are new systems and even some entirely new types of small equipment to help in running the war-time office. Despite supply difficulties, however, we found that business directors were anxious to have our usual complete survey of Administrative Equipment for convenient reference. There being no Exhibition this year, it was particularly necessary to supply directors and managers with as full a record as possible of Administrative Equipment manufactured or sold in this country. In some instances, therefore, the model described cannot be supplied at present.

Confidential enquiries about any of the equipment may be addressed to the Editor.

ADDRESSOGRAPH - MULTIGRAPH LTD., 29 Kingsway, London, W.C.2.

MODEL 40 "MULTIGRAPH" DUPLICATOR, one of the most versatile duplicators on the market. Apart from reproducing typewritten matter, this machine will duplicate handwriting, pen and brush drawings, and ruled forms.

MODEL 000 AUTOELECTRIC ADDRESSING MACHINE is the latest addition to the wide range of machines for addressing purposes. The model embodies new features, including flexible rack lister, simplified adjustment of platen pressure, etc.

ART METAL CONSTRUCTION COMPANY, 199 Buckingham Palace Road, London, S.W.1.

FILING CABINETS: are made in two depths, 24½ in. and 28½ in. with and without automatic lacking in the following sizes—quarto, foolscap, oversize foolscap, invoice, folded document, 5 in. by

Raw staff—shortage of materials
—lack of time—need for economy
—all these war-time obstacles can be overcome by the latest office machinery yoked to the best administrative methods

3 in., 6 in. by 4 in., 8 in. by 5 in. and 9 in. by 6 in.

DESKS AND TABLES: of high grade steel with Artolin tops. There are three standard sizes. File drawers are carried on progressive roller bearings and box and knee-space drawers are on channel suspensions.

AMBIDEX EQUIPMENT CO., 13 Keynsham Ave., Woodford Green.

AMBIDEX SORTERS: for sorting original documents such as letters, invoices and copies, job cards, costing slips, etc., prior to filing, mailing, ledger posting, analysis, etc., are the principal products of the Company. It is claimed that 50 per cent. faster sorting is achieved by the elimination of the waste effort entailed in the pile or pigeon-hole methods, and the sorting is practically finished in one handling of the papers.

These sorters are made in a wide range of sizes and types and almost every individual need can be met. Desk models have from 25 to 150 divisions for dealing with 100 to 1,000 papers, sorting can be divided into alphabetical, numerical, territorial or special headings.

For dealing with bulkier papers and greater volumes of papers there are standard model Ambidex sorters in various sizes up to 1,200 divisions.

See announcement on page 47.

AUTOGRAPHIC BUSINESS FORMS LTD., Australia House, Strand, London, W.C.2.

AUTOGRAPHIC DESK REGISTER: offers speedy operation—a turn of the handle ejects as many copies of the written set as may be desired and at the same time files one or more copies in numerical order in a locked compartment.

This same operation brings the next set of forms into writing position in perfect registration. No carbon rolls are necessary, the single long-life durographic carbon sheet gives over 500 perfect carbon copies, and may be clipped in position in a moment.

THE BANTAM MODEL is a hand model in light aluminium which can be carried and used just like an order book. It offers most of the advantages of the desk

model with the additional features of portability and lower cost.

THE WRITE-AWAY ATTACHMENT: This is an ingenious attachment which operates on any typewriter and dispenses with all the messy time-wasting fumbling with carbon sheets. The durographic carbon discs drop between the sheets or continuous forms and produce perfect carbon copies either of part or of all the information. It is simple to use, and effects a big saving in both carbon costs and operators' time.

See announcement on Cover i.

BLOCK & ANDERSON LTD., "Old Mill House," Trumpington Rd., Cambridge.

FACIT CALCULATING MACHINE: new model of an advanced principle; first machine produced on the single ten-key method of operation. Hand or electric.

VICTOR ADDING MACHINE: adds, subtracts and prints results. Also prints sub-totals at any position during work. Provides direct subtraction.

VICTOR DUPLEX ADDING MACHINES: electrically operated. Model 25 allows several groups of figures to be added and individual totals obtained for each group—at the same time accumulating grand total of individual group totals. Model 30, in addition has two separate adding registers, can therefore be used as "two machines in one"—for instance, adding two groups of figures (debits and credits—receipts and expenses, etc.), obtaining two individual totals in one operation.

ORMIG SPIRIT DUPLICATING MACHINE: Reproduces anything written, drawn or typed in as many as six colours at one operation. No ink, stencils or gelatine required. Ideal machine for up to 200 copies.

SIMPLEX: for the preparation of operations tickets, material requisitions, progress slips, manufacturing cards, routing sheets, cost cards, etc., from one Ormrig master. This method eliminates re-writing or re-typing any information common to different forms and makes re-checking unnecessary.

LANGAPRES PORTABLE PRINTING MACHINE: for overprinting literature, letter-headings, etc. Prints direct on to made-up boxes and cartons or practically any surface or material. 27 models.

LIGHTNING ENVELOPE OPENING MACHINE: models for incoming mail from 50 to 50,000 letters. Takes any shape or size of envelope. Automatic feed and cut adjustment on all models.

VELOPOST ENVELOPE SEALING MACHINE: for envelopes of mixed shapes, sizes and thickness in use. Special feature is electrically heated water for the sealing. Machine is electrically operated; sealing speed of over 100 per minute.

See announcement on page 3.

THE BRANDT AUTOMATIC CASHIER CO., LTD., 41 Farnival Street, E.C.4.

WAGES MACHINES: These machines issue cash with a speed and accuracy of which no combination of human brain and fingers is capable. There are more than 500 variations in the method of paying wages in common use to-day but one or more of these machines can be installed without altering any existing arrangement. Statistics prove that 90 per cent. of errors in wages occur in the coin-counting. Also, in wages make-up coin counting absorbs more than two-thirds of the total time taken. These cash issuing machines automatically select the correct coins to any amount for which the key depression is made. For example, press *one* key for 9s. 8d. and automatically two half-crowns, two florins, one sixpence and two pennies are delivered into the hand or wage envelope held at the chute. One machine will hold £30 to £40 of mixed silver, with a reserve storage tray holding £70 more. This is sufficient for an average payroll number up to 400.

Owing to war restrictions, stocks are low, but the company can still supply their full-size change giving and also junior automatic cashiers, as well as the Model 4E automatic cashier, which has a key for every amount of silver and copper from 1d. to 9/11d., but does not use any type of 3d. piece.

See announcement on page 46.

THE BRITISH TABULATING MACHINE CO. LTD., Victoria House, Southampton Row, London, W.C.1.

ELECTRICAL TABULATING EQUIPMENT: Hollerith accounting machines can be entrusted with almost any type of accounting work, including vital statistics, cost summaries, analyses of sales, purchases, etc., invoices, ledger posting and customers' statements. This list is, of course, by no means exhaustive and the company is always ready to explain and demonstrate, at any time, any phase of work on which machines are to be utilised.

Machines are not sold outright but are supplied on hire only, and users are thereby relieved of the necessity of disturbing capital. Moreover, the full cost of handling any specific job is known definitely at the outset, and should a change be desired at any time to a larger or different type of

cases where the bulk of work will not justify the installation of a complete set of machines, or at peak periods, arrangements can be made to carry out any kind of calculating or statistical work in the company's service bureau at any of its offices.

Among the machines thus available are:
80-COLUMN MECHANICAL VERTICAL PUNCH: used to record data on tabulating cards by means of punched holes, thereby preparing accurate, permanent and unalterable records.

80-COLUMN MECHANICAL VERTICAL FIER: used as a mechanical means of proving the accuracy with which the punching operation was performed.

AUTOMATIC KEY PUNCH: used to record data on tabulating cards by means of punched holes, thus preparing permanent and unalterable records for the electric accounting method.

AUTOMATIC COMPARING REPRODUCING PUNCH: is capable of performing three separate and distinct functions; (1) comparison of the punching in two sets of cards, (2) reproduction of the punching from one set of cards into another set of cards, and (3) gang punching from a master card or cards.

ALPHABETICAL DUPLICATING PRINTING PUNCH: is used to record both alphabetical and numerical data on tabulating cards by means of punched holes, at the same time printing this information along the top of the card.

AUTOMATIC INTERPRETER: is used to translate the holes punched in a tabulating card into plain figures at the top of the card. The information to be printed may be shown at any place along the top of the card. This is made possible by a plugboard which provides entire flexibility.

HORIZONTAL SORTER: automatically groups all cards of similar classification and at the same time arranges such classifications in numerical sequence. It is extremely easy to operate. All the operator has to do is place a group of cards in the feed box, set the sorting brush on the column to be sorted and press the starting button. The sorting operation, automatically performed, is accomplished at a speed of 400 cards per minute.

HOLLERITH ELECTRIC ROLLING TOTAL TABULATOR: has been evolved in order that standard tabulations may be produced under better conditions, and, further, with a view to producing a large variety of tabulations previously unobtainable.

E6/6 TABULATOR: is a multiple adding, classifying and printing machine, which, actuated by punched tabulating cards, produces printed tabulations. It will list details from individual cards or will print totals with numerical designations and accumulated totals.

See announcement on page 31.

BURGESS PRODUCTS CO. LIMITED, Hinckley, Leics.

Office and workshop noise prevention specialists and acoustical engineers.

See announcement on page 31.

BURROUGHS ADDING MACHINE LTD., Chesham House, 136 Regent Street, London, W.1.

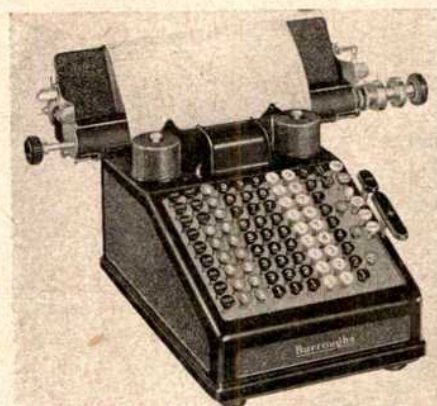
BURROUGHS MACHINES: a complete line of over 450 standard models and 2,000 features, designed to save clerical time, reduce accounting costs and provide prompt, accurate figure-control essential to business production. There are models

every kind of office:—invoicing; purchase and payment records; stores and material control—ensuring material being available when required; up-to-the-minute cost records—providing expense and production costs for review; labour accounting—in all its phases; A.R.P. records; budgetary control, etc. The majority of Burroughs machines will complete—at the one writing—a number of related records. One checking only is required.

The national emergency which has reduced clerical staffs and affected the grade of labour, necessitates—more than ever—machine operation and accuracy.

Representative classes of the range of Burroughs machines are listed below.

DESK ADDING AND BOOK-KEEPING MACHINES: short-cut keyboard makes machines easy to use, ensures speed and accuracy. Portable; efficiently



The Burroughs Desk Adding Machine

operated without special training; occupy less space than typewriter.

DESK ADDING MACHINES: styles with six, seven, eight or ten columns capacity, wide or narrow carriage, hand or electric operation. On subtracting models "plus" motor bar automatically adds the amount, "minus" bar automatically subtracts. Duplex models add two sets of figures simultaneously. All models have automatic ciphers.

DESK BOOK-KEEPING MACHINES: machine-posted accounts and records for small business. All ledgers posted and balanced daily; correct statements promptly dispatched. Daily figure facts obtainable in a few minutes.

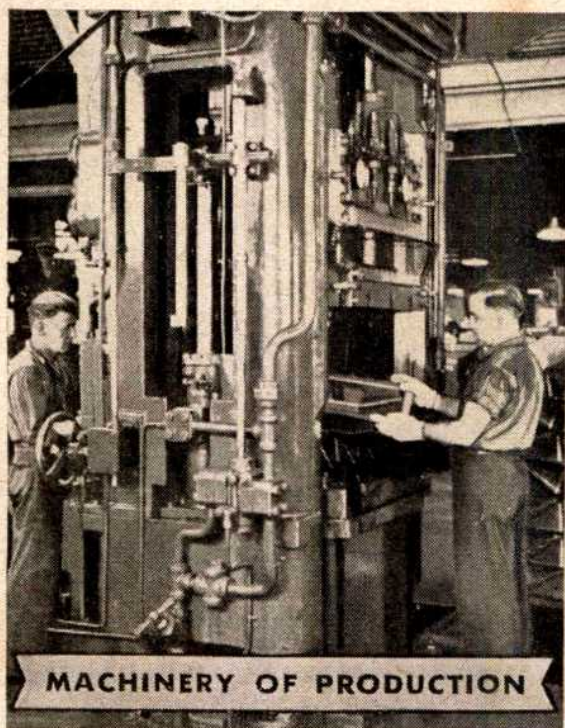
ACCOUNTING MACHINES: for all book-keeping and statistical work. Readily adaptable to many kinds of accounting records. Many styles and sizes. All ledgers posted and balanced daily; accuracy of posting automatically proved as made. Additions and subtractions automatically controlled; totals of postings automatically accumulated.

MULTIPLE-TOTAL MACHINES: high speed multiple total accounting; models designed for public utility billing. Others for all work necessitating automatic analysis under numerous headings, simultaneously with posting operation.

TYPEWRITER ACCOUNTING MACHINES: combine automatic features of electrically operated adding-subtracting book-keeping machine with standard typewriter. Used for accounting work requiring description.

ALL-PURPOSE ACCOUNTING MACHINES: typewriter accounting machines, flexible, readily adaptable to many kinds of accounting records. Important features: minimum number of result

VITAL TO THE NATION'S EXPANDING PRODUCTION



MACHINERY OF PRODUCTION



MACHINERY OF CONTROL

As essential as the machinery in the factory is the machinery in the office which provides executives with vital control figures, such as—

BUDGETS — Estimates, specifications and commitments that precede actual factory production.

PURCHASING — Purchase orders and sales records that speed delivery of parts and materials—prevent misunderstandings.

MATERIAL CONTROL — Requisitions, receiving records, stock records that control the flow of materials to scheduled rate of output—furnish up-to-the-minute statistics and reports.

LABOUR ACCOUNTING — Earnings calculations, wage accruals, income tax and pay roll records that ensure prompt payment of personnel—provide adequate statistics and reports.

COST RECORDS — Cost-to-date figures—available every day—that provide expense and production controls and statistics for review.

MANAGEMENT FIGURES — Vital figure-facts, statistics and reports that permit quick decisions, quick action.

To-day modern Burroughs machines provide every type of required record and figure control in less time, with less effort, at less cost.

BURROUGHS ADDING MACHINE LIMITED
Chesham House, 136, Regent Street, London, W.1

Burroughs

keys; all totals and balances—debit or credit—computed and printed automatically by depressing a single key; negative balances printed red, with distinguishing symbol; automatic punctuation and tabulation for sterling amounts; automatic subtraction; automatic dates.

TYPEWRITER CALCULATING MACHINES: perform any calculation; print result by depression of a single key; combine multiplication with addition and subtraction; full typewriter keyboard; automatically accumulate totals.

MULTIPLE-TOTAL TYPEWRITER ACCOUNTING MACHINES: for accounting, distribution, statistical and tabulating work requiring full description. Complete several records at same time; accumulate large number of totals; tabulate direct to required column—without stopping at intervening columns.

NON-LISTING ADDING- CALCULATORS: key-driven; hand or electric; 6, 7, 8, 10, 12 and 14 columns results capacities. For all figure-work where printed record not required. Electric duplex calculator has two accumulating registers; (1) for individual totals or calculations (2) accumulating direct subtraction by use of a single key. Other styles include small desk drawer model weighing only 7½ lb., measuring 11½ in. by 7½ in.

ELECTRIC CARRIAGE TYPEWRITERS: operated entirely from keyboard; built-in electric motor; electric carriage return; electric line spacing; electric shift. Wide selection of styles for invoices, cheques, receipts, etc.

FANFOLD MACHINES: for continuous invoice and other multiple forms without interleaved carbons. Carriage opens automatically; forms released automatically; carriage returns automatically. See announcement on page 23.

CARTER - DAVIS LTD., Queen Elizabeth Street, London, S.E.1.

"PRIMUS" CONTINUOUS STATIONERY: with "Primus" attachment and carbon pack enables stationery to be used with any standard typewriter. Attachment eliminates waste time in typing multiple records; assembling, interleaving and removal of forms from machine abolished. It also makes typewriter dual purpose machine—typewriter one minute, billing machine next; removing or replacing attachment not necessary.

MACHINE ACCOUNTING STATIONERY: fulfils requirements of alignment, registration, etc., for machine accounting. Firm specialises in producing stationery to meet exact individual needs.

DAILY BALANCE SYSTEM: for obtaining daily proven figures without use of accounting machines; machine method applied to pen and ink; allows writing three records in one operation; customer's statement, ledger account, daily journal.

"PRIMUS" AUTOGRAPHIC REGISTER: for using continuous stationery for all types of hand-written records; open construction; simple to operate; no complicated mechanism.

See announcement on page 25.

C. W. CAVE & CO. LTD., 9 Barnsbury Park, Liverpool Road, London, N.1.

Makers of "Joca" letter files; "Cavedex" visible index and strip index, revolving and desk stands; "Findex" hand selecting card sorting system; "Jocamatic" blotting pads; "Charterhouse" revolving trays; "Seat-o-Matic" chair pads "Cavedex" Junior books and limited models in wood office desks and chairs.

CONSTRUCTORS LTD., Tyburn Road, Birmingham.

STEEL SHELVING AND STORAGE EQUIPMENT: based on "Adjusteel" standard components of posts, shelves, backs, partitions, bin fronts and dividers, doors, etc. Each unit complete with four posts; may be disconnected without removing single shelf. Single-faced stacks are two or more units bolted together; double-faced stacks made by placing two units of similar width and height back to back; any number units in length. "Pressnap" bin dividers sub-divide shelving space.

STEEL CYCLE PARKS: sloping or horizontal parking single- or double-sided, fully or partly enclosed. In double-sided parks cycles occupy only 6 in. space width. Unit construction principle; steel coated in special rust preventive, finished in grey stoved enamel. Over 30 different types are available.

STEEL CLOTHES LOCKERS: one, two and four-tier models; fire resisting; built on unit principle, can be added to or rearranged easily. Door frames welded at all joints, bottom shelves louvred, feet made of rubber, door pressed to channel section on all edges, welded for strength.

STEEL FILING CABINETS: finished in stoved olive-green enamel; automatic locks; frictionless drawer-slides based on extending suspension principle; lock-compressor to each door.

STEEL CUPBOARDS: stoved olive-green enamel finish; three-way locking.

"MERCANTILE" DESKS AND TABLES: washable tops of dark green "Conolin" bronze binding. Drawers rigid-built on steel slides; sliding shelf; standard finish stoved olive-green enamel.

Company Also Makes: card index cases, stationery cabinets, letter racks and trays, wastepaper bins, etc.

See announcement on page 5.

COPELAND-CHATTERSON CO., LTD., Exchange House, Old Change, London, E.C.4.

MACHINE-POSTING: Large variety of trays and trolleys, binders, speedrails and other forms of equipment in all styles and sizes, including fire-protection files and cabinets specially adapted to accounting by machines. Ledger cards, statements and other forms to suit any purpose.

VISIBLE RECORDS: Probably the largest range offered by any combination of firms. Card sizes vary from 2½ in. by 1½ in. to 16½ in. by 12 in., and there are several styles to suit various purposes in both pocket and non-pocket types.

PUNCHED CARD SYSTEMS: This hand-operated method of sorting and analysing requires no machinery or expensive operators. It is handled entirely by juniors; cards can be any size and can be a single-copy or any part of a multi-copy set.

SLIP POST: This unit posting method employs each original entry in such a manner that copying and its attendant disadvantages are dispensed with. As the name implies, each entry, instead of being made in "omnibus" form, is made on a unit slip designed to be physically transferred, through numerous transactions in which it may be involved, to the final presentation or account. Posting speeds are amazing, reaching up to 1,500/2,000 per hour per girl junior operator. Slip post unit slips can be punched for paramount sorting and can be arranged for display in visible record or other accounting systems and equipment.

LOOSE LEAF: The Cope-Chat range of binders is comprehensive over all forms and sizes of thong, post, section post, spring types. All loose leaf needs can be met from the Cope-Chat Range, and the sheets, indexes and accessories are up to the same high level of the binders.

CONTINUOUS STATIONERY: Interfold and Fanfold stationery, plus the "Fasta" billing unit, is a fine combination for users of continuous stationery. The "Fasta" billing unit costs only a couple of guineas or so and will convert any standard typewriter into a high-speed billing machine in less than five minutes without interfering with normal typewriter functions.

PRINTED FORMS, ETC.: Cope-Chat are essentially systems printers with precision machinery which produces all manner of business forms with perfect registration, alignment, perforation, numbering, etc., either in singles or in multi-part sets of all sizes.

FIRE-PROTECTION CABINETS AND FILES: A wide range, many of which are specially designed for use with machine accounting and vertical visible.

COST AND WAGE CALCULATOR: The latest addition to the Cope-Chat range. A simple holder which uses existing job cards to provide details of time cost on production work. An infallible contrivance which can be operated without error by a junior.

GENERAL: In addition to the comprehensive range of standard products Cope-Chat device and manufacture special items in all their lines to meet special needs. See announcement on page 7.

COX & CO., Watford By-Pass, Watford, Herts.

STEEL TUBULAR FURNITURE: desks; tables; chairs for every grade of office and for works and canteens; nesting chairs and tables. Settees and reception-room furniture, trolleys, etc.

This type of furniture is notable for its light and hygienic qualities.

See announcement on page 2.

DEFINAC LTD., 42 Chessington Ave., London, N.3.

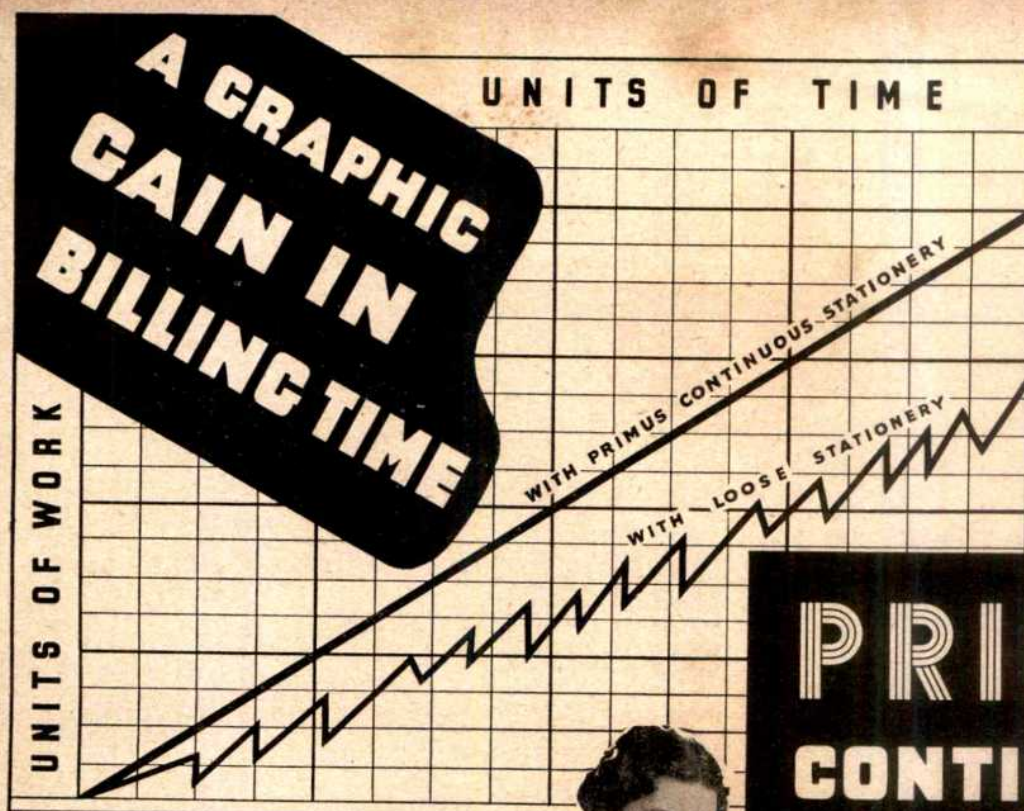
DEFINAC ACCOUNTING EQUIPMENT AND STATIONERY: Definac accounting is "controlled book-keeping." It covers all branches of accountancy from sales, purchase and nominal ledgers to cost accounts and works progress accounts, including stock control, wages records, job and unit costing.

A common feature of the Definac methods is that several entries are performed in the same operation by hand-posting, and that control-sheets are extracted providing running totals in any desired classification. Automatic monthly statements have made a wide appeal.

DEFINAC VISIBLE RECORDS: Definac Visible is a unique and novel method of "visible indexing," based on the Definac signal tab, the only signal that will pass through any accounting machine or typewriter. When a card is removed from the tray for reference, the signal or signals stay with the card—not in the tray. Definac Visible is therefore as valuable as machine posting equipment as for records entered by hand or typewriter. Existing records can be converted without re-writing and without the expense for new containers.

The trade mark "DEFINAC" has superseded the older name "DEFINITIVE."

See announcement on page 2.
(Please turn to page 26).



◀ A smooth flow of uninterrupted work which enables the typist to do as much in three hours as would ordinarily take her four.

◀ One-third of the typist's time is lost in preparing forms for insertion in the typewriter, thus constantly retarding the progress of the work.

PRIMUS CONTINUOUS STATIONERY

The PRIMUS attachment, as supplied by us, fits any typewriter and facilitates the smooth flow of continuous forms. It allows the machine at a moment's notice to be used for either billing or ordinary correspondence work.



FOR HANDWRITTEN RECORDS...



The PRIMUS Autographic Register is designed to simplify the work of writing documents by hand. It is so constructed as to allow a number of duplicates to be made at one writing and at the same time automatically retains a check-duplicate under lock and key.

**Carter
Davis
Ltd.**

QUEEN ELIZABETH STREET, LONDON, S.E.1.

'Phone : HOP 0204-5-6. 'Grams : Cedavislim, Hop, London

THE DICTAPHONE CO. LTD.,
Kingsway House, Kingsway, London,
W.C.2.

THE DICTAPHONE CAMEO: In their latest model, the "Cameo", Dictaphone Company have produced a wonderfully compact instrument, much smaller and many pounds lighter than the Model 12, which has been standard for the past two or three years.

As will be seen from the accompanying illustration, the Dictaphone "Cameo" is designed on lines which break sharply away from tradition. What may be termed the "streamline" effect characteristic of the earlier Model 12 is accentuated and the contours of the machine are singularly smooth and graceful.

Shorter, lower and much lighter than any earlier model, the "Cameo" weighs but 19 lb. 12 ozs. and so is readily portable. It measures 11½ in. by 6½ in. in area and is only 8 in. high, while an ingenious set-back base makes the actual desk area occupied only 63 square inches.

In its recording and reproducing qualities, the "Cameo" shows decided advance on all earlier models. With the improved "progress" recorder, volume and



The "Cameo" Dictaphone

clearness of tone are so well balanced as to secure an absolutely faithful reproduction of the natural voice, rendering the task of the transcribing typist much easier, swifter and more agreeable.

THE DICTAPHONE "TELECORD": Various minor constructional improvements have been effected in the Dictaphone "Telecord" which has been on the market for several years and is now becoming a familiar feature with firms in whose business the telephone plays a specially important part.

Without interference with the ordinary use of the telephone, the "Telecord" will make, whenever desired, an automatic record of any telephone message or any phone conversation from both ends of the line. The message or conversation, as the case may be, is recorded on the ordinary dictaphone cylinder and transcribed from the standard transcribing machine.

The "Telecord" has all the advantages of speed and accuracy characteristic of the Dictaphone. Reception can be effected at practically double the speed possible with shorthand—a valuable consideration in reducing pressure on the telephone lines—while the automatic record, which can, of course, be repeated as often as desired, is a complete safeguard against errors so apt to occur in figures, quotations and similar matter.

By fitting a microphone, the "Telecord" can be used to secure verbatim and automatic reports of meetings, staff conferences and similar gatherings.

See announcement on page 1.

DICTOGRAPH TELEPHONES, LTD.
Head Office and Works, Aurelia Road,
Croydon, Surrey.

DICTOGRAPH EXECUTIVE OR MASTER STATION private intercommunicating telephone. Dictograph master station is installed on chief executive's desk; upon instrument is a row of small switch keys, each connected with a department of the business. The executive desiring to talk with Dept. No. 1 will touch key No. 1. That will ring substation in Dept. No. 1; light on substation indicates chief executive calling. Ringing and light continue until person called attends the substation. Meanwhile, executive goes uninterruptedly on with his duties until voice of the wanted person comes through the loud-speaker.

PRIORITY AND PRIVACY: Dictograph system enables members of all depts. to communicate with one another, but executive calls automatically get priority.

STAFF LOCATION: Dictograph sound system of staff location through loudspeakers is now being widely developed. The name or code number of a wanted person is announced from one of several points, which may be in the chief executive's room, the general office, telephone exchange, time office or A.R.P. control, etc.

MUSIC IN FACTORIES: The addition of gramophone and radio units to the staff location equipment makes possible the broadcast of gramophone records and radio programmes including the "Music while you work" programmes of the B.B.C. designed specially to stimulate industrial production effort.

A.R.P. A combination of Dictograph telephones and sound equipment will facilitate control of staff in emergency, whether in factory or air raid shelters, and provide entertainment to counteract nervous tension which is inevitable during and following air raids.

See announcements on page 40 and 47.

THOMAS A. EDISON, LTD., Vernon House, Vernon Place, Southampton Row, London, W.C.1.

THE NEW DESK EDIPHONE: Outstanding features are its compactness—the space it occupies is little more than a box of cigars—a roll back disappearing metal cover which when shut completes the enclosure of the entire machine, a newly designed recording unit known as Truvox, a safety signal light which flashes when the shift lever is not correctly set for dictating—a silent and unescapable warning. All the other well known features of Edison design such as Keymatic index, Eject-o-matic Mandrel are incorporated in this model. It is mounted on rollers at the back and rubber feet in front which, by tilting the machine slightly backwards, enables the machine to be rolled to any position on the desk with one hand. The machine as a whole presents an attractive appearance.

See announcement on page 37.

EGRY, LTD., Warple Way, Acton, London, W.3.

"SPEED-FEED" ATTACHMENT: for typewriter introduces the benefits of continuous stationery. It is made to fit all standard typewriters and snaps on easily for billing or other work where continuous forms can be advantageously used.

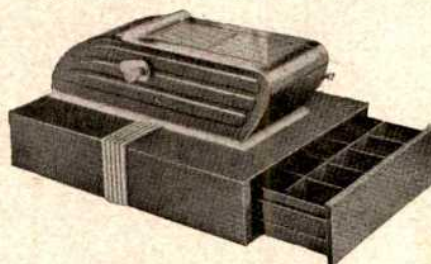
A feature of the "Speed-Feed" is an automatic dual aligning-pin that engages punched holes at the head of each set of forms; alignment of all forms in the set

being fed into the typewriter is thus controlled, ensuring automatic registration.

"TRU-PAK" REGISTER: is virtually a mechanised manifold book and will speed up the production of routine forms requiring carbon copies by eliminating altogether the interleaving of carbon paper.

The requisite sets of forms are provided in continuous lengths, so that at one writing and one turn of the operating handle the written set is discharged from the register and a fresh set is brought into position, ready for use without handling the stationery.

One or more complete copies of the



The Egly "Trupak" Register

issued set of forms is retained under lock and key in the register as a master control copy, thus providing protection over all transactions entered on the machine.

"HANDIPAK" REGISTER: embodies the basic advantages of the "Tru-Pak" register in a convenient portable form. The great advantage is that it can thus be easily carried from job to job in office, warehouse or factory.

"COM-PAK" MANIFOLDER, for the simple purpose of producing an original written form and up to five carbon copies. One turn of the handle delivers all the forms in the set for distribution to departments.

"COM-PAK" RECORD, similar to the manifolder but retains one copy of written form within locked compartment.

"COM-PAK" SUMMARY: Unlike the "Com-Pak" record, which retains a complete copy of the issued forms, this model retains a dissected analysis or summary of certain selected items only.

"NU-PAK" is British made and in general differs only from the other Egly registers in that it has a lever handle operation. A new feature embodied in this machine is the fact that it can be loaded without the operator having access to the record compartment.

See announcement on page 6.

ELLAMS DUPLICATOR CO. LTD., 12 King Street, Cheapside, London, E.C.2.

Duplicating equipment: For nearly 50 years this firm has specialised in the manufacture of duplicating machines of many varieties from the simple, hand-operated "Bantam," costing from 35s., to the M.10 automatic electric model, at 58 guineas.

M.10 MODEL: A rotary duplicator with variable printing speeds from 40-120 copies per minute. It is fitted with variable printing pressure and balance which ensures regular printing strength. The printed copies are counted, and automatic mechanism provides that only the number of copies required are printed.

M.1 MODEL: To a great extent the same as M.10, with the exception of the power drive. It prints from a bulk supply of paper, of heavy substance, and con-

(Please turn to page 36).



**Speedy
Reconstruction
OF BUSINESS RECORDS**

For safety's sake you should use accounting and record rulings which are standardised, and which can be rapidly replaced in case of loss—thus facilitating the restoration of normal business activities.

Kalamazoo have 150,000 designs available (for Loose-leaf, for Visible and for Machine Accounting) prepared for 60,000 customers. They cover practically all purposes. Very many of them are printed and are in stock—others are available at a few day's notice—

to replace your lost records without trouble and delay.

If Kalamazoo print your forms to your own special design, the printing medium is retained in the Strong Room; your risks are thereby spread and you make certain of quick replacements. Ask your local Kalamazoo Representative for particulars.

(Proprietors, Morland & Impey, Ltd.) **Kalamazoo Ltd** (Sales)
NORTHFIELD * BIRMINGHAM 31

Industrial Production Equipment

NEW

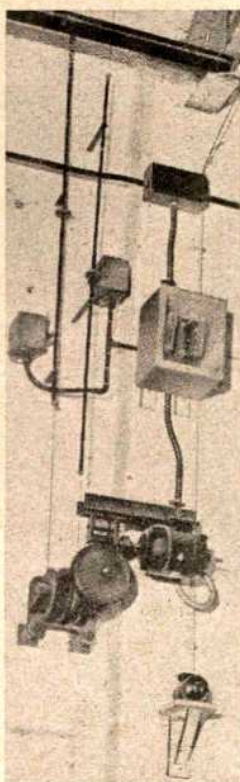
17 FACTORY BLACKOUT BY PUSH BUTTON

An interesting blackout and camouflage installation recently completed at a large factory, is a great advance on most of the methods so far employed. The installation provides for "blacking out" 550,000 sq. ft. of roof lights in the factory in 15 seconds by pressing a button, and doing the reverse process in the same way and in the same time.

Originally, the factory was completely "blacked out" by means of hard wallboards fitted to the outside of all the north lights and other windows of the factory.

Much has been said about the psychological effect of daylight, but, this consideration apart for the moment, the management decided that they would provide some means of making, at least, a proportion of the obscuration to open and shut, and the resident engineer undertook the task of preparing a scheme and of installing the necessary equipment.

Every alternative panel was removed from the north light windows and they were fixed into a frame in their respective positions over the windows and the frame itself was made to move laterally across the whole span of lights through grooves cut in the sections fixed to the glazing bars.



The $\frac{1}{4}$ h.p. electric motor, winch and other apparatus for closing 1,000 square feet of blackout.

18 CALCULATOR KILLS 70% OF COSTING ERRORS

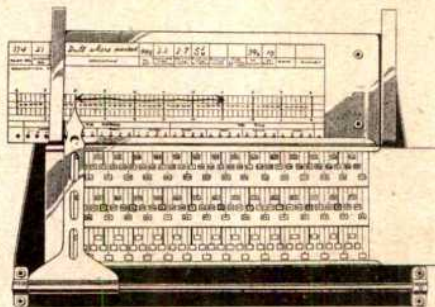
A simple slide calculator, which uses actual job time cards as an integral part of its equipment, has just been introduced. Master calculation cards for every wage rate paid to workers in a factory are the basis of this remarkably simple system, which gives the exact time cost of any job, irrespective of whether it

for the Office, Factory ARP and Packing

•Readers are invited to make use of this valuable information. The name and address of the manufacturer of any product described may be had on application to the Editor, BUSINESS, Whitefriars House, Tallis Street, London, E.C.4. To simplify your request you may refer to the items by number only.

•Manufacturers and distributors are invited to send complete information about their new products for inclusion in this feature.

takes only ten minutes or ten shifts to complete. With the appropriate master card in position in the lower rack and the indicator pointer set at zero, the only task to be performed to get the costing figure is the insertion of the job card and



The New Wage-cost Calculator

for the pointer to be moved along the slide until it is on the line indicating the completion of the job.

19 ELECTRIC HEATER FOR FACTORY SHELTERS

An effective self-contained electric heater which has sufficient power in a $1\frac{1}{2}$ kw. unit to heat a shelter of 1,500 cu. ft. capacity has just been introduced. It has a heavy precast concrete casing with fixed lugs for fastening to wall. It is supplied with or without electric element. A smaller element using 1 kw. can also be supplied. The base of the heater has a two-way flap so that air from either the interior of the shelter or from outside may be used.

NEW

20 PRINTING ON PLASTICS AND WAXED PAPER

Paint transfers have long been recognised as one of the most effective means of publicity on windows and air raid hoardings. Now they are achieving new success. records in entirely different spheres. They have been successfully used to solve the problem of applying trade names, etc. to plastic packs for cosmetics, etc., and are a distinct improvement when used on glass or china containers. Today, however, it is difficult to obtain glass or china containers and many cosmetic manufacturers have to turn to waxed containers, normally used for cream, ice cream, etc. Once again, paint transfers



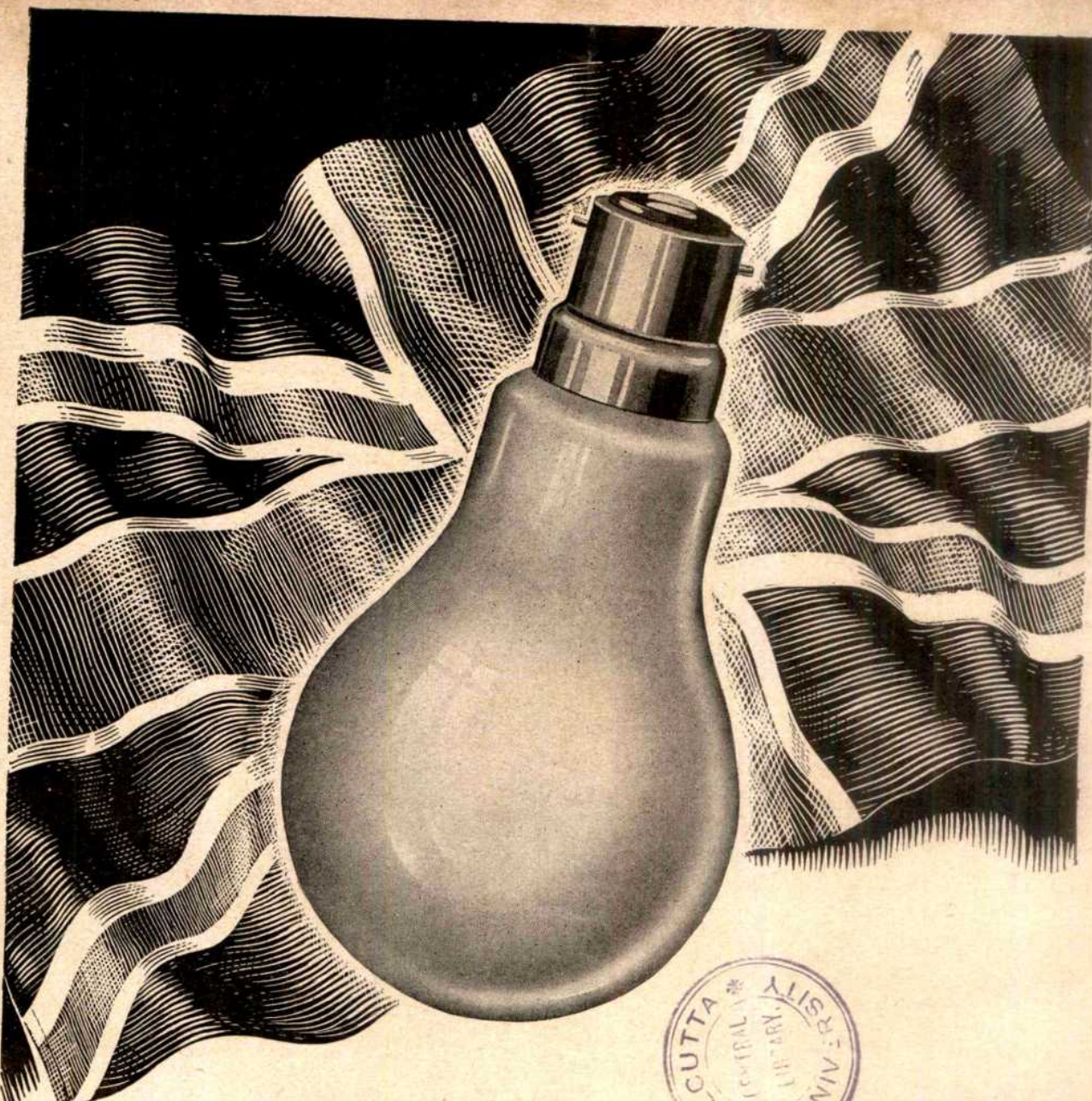
Typical Cartons printed by New Paint Transfer Method

solve the problem as they can be applied to this most difficult material just as easily as on to glass and, by their brilliant relief effect, contrive to enhance the otherwise commonplace appearance of the waxed container.

In engineering circles paint transfers can be equally successful. There is a war time shortage of the metal and celluloid labels hitherto familiar on electrical and other equipment. Paper is not always an effective substitute, particularly if the unit is used in damp surroundings. The potentialities of paint transfers for this purpose are great. The type most favoured is the slide-off style upon which the design is printed on to a base of paint in the required colour and size.

21 HYGIENIC SELF-SEALING WAGE ENVELOPES

The hygienic system of sealing envelopes, which comprises twin bands of adhesive rubber solution which effectively seal envelopes so that they cannot be opened and resealed without betraying the fact, has now been adapted to various sizes of wage envelopes. This provides a safeguard against tampering with the contents once the wages have been checked and the packet sealed.



See it through with
PHILIPS LAMPS

GOOD LIGHTING INCREASES OUTPUT & EFFICIENCY

PHILIPS

LAMPS LIMITED, CENTURY



HOUSE, SHAFTESBURY AVENUE, W.C.2

The Right Paint can cut Electricity Bills by 35%

WHEN I walked into the showrooms of a well-known time-recording company recently I was surprised at the unusual brightness of the whole establishment.

At first I could not be sure what was responsible for the change. It certainly was not the lighting, for the fittings were the same as they had been for several months. Then suddenly, I realised that the old beautiful but sombre mahogany panelling that had hitherto covered the walls had gone.

Two Lights Do The Work Of Three

When I complimented the manager on the change, he told me that the panelling had not been removed but merely painted over. "It is certainly a sacrifice of good wood, but the results have been well worth it," he said. "Both customers and staff are brighter since the change and the percentage of sales has gone up very considerably. All due, we think, to the new paint. And what is more, we are only using two lights where three were necessary before."

The Eye Usually Sees Only Reflected Light

Paint plays a most important part in the general appearance of any room, office or factory workshop. It can also, as the above reported incident shows, mean a very substantial saving in your bills for electric current. This is due of course, to the fact that practically all important light is reflected from one or more surfaces before the eye sees any illuminated object.

Tests with painted surfaces of various colours show that with the right coloured reflecting surface, over a third less current is required to provide adequate illumination than when a dark, non-reflecting colour is used.

Type of Lighting Affects Reflection Factor of Colour

The proportions of light reflected by walls and ceiling of various colours, that is their reflection factors, have an important bearing on both the natural and artificial lighting. The proportion reflected will depend somewhat on the colour of the incident light. In the table above the figures show the proportion of the light of gas-filled lamps that various painted surfaces will reflect.

For reference purposes the British Standard colour for ready-mixed paints (B.S.S. 381) is quoted both by name and number.

Colour and Reflection Value are both Vital Factors in Efficient Lighting

By BUSINESS Lighting Consultant

Colour.	B.S. Colour No.	Reflect. Factor	Colour.	B.S. Colour No.	Reflect. Factor	Colour.	B.S. Colour No.	Reflect. Factor
White Paper	—	84%	Silver Grey	28	37%	Primrose	54	76%
Sky Blue	1	30%	Quaker Grey	29	30%	Lemon	55	69%
Turquoise	2	15%	French Grey	30	36%	Golden Yellow	56	80%
Peacock Blue	3	11%	Light Battleship Grey	31	31%	Orange	57	42%
Light Brown	10	27%	Dark Battleship Grey	32	11%	Light Buff	58	61%
Middle Brown	11	12%	Post Office Red	38	17%	Middle Buff	59	54%
Golden Brown	14	25%	Crimson	40	6%	Deep Buff	60	31%
Eau de Nil	16	47%	Salmon Pink	43	44%	Light Stone	61	58%
Sea Green	17	38%	Pale Cream	52	76%	Middle Stone	62	37%
Grass Green	18	18%	Deep Cream	53	70%	Dark Stone	63	33%
Sage Green	19	19%				Portland Stone	64	62%

Here are some of the most popular colours, with their respective reflection factors

a bright interior will have on the workers themselves. Fatigue is lessened and the zest for work goes up by leaps and bounds with cheerful tinted walls. Most of the bogeys of the black-out—the dark corners and gloomy arches of the roof—can be banished with the wise use of light-coloured paints, which have a high reflection factor.

How Old is Your Office Lighting Installation?

Pre-Winter Overhaul can Increase Staff Efficiency and Output at Small Cost

THIS is the period of the year when it is imperative to check the effective value of your electric lighting system. All too often the lighting in factories and offices is far below the standard possible with the fittings installed, owing to dirt and the age of the lamps.

In most industrial plants the new Government lighting standards have resulted in the lighting installation being recognised as an efficient tool. It is in offices that lighting is most frequently inadequate. In a recent investigation it was found that over 50 per cent. of business offices are without proper lighting.

Good Lighting Gives 20% Increase in Output

This cannot be excused on account of cost, since even with electric lighting rates comparatively high, say 5d. per unit, one penny will buy two hours of light from a 100-watt light. This light source and its output are sufficient for at least one worker. Forgetting that some light was already being supplied and regarding all this cost as increased

expense, we arrive at a figure of 4d. for eight hours of adequate illumination per employee.

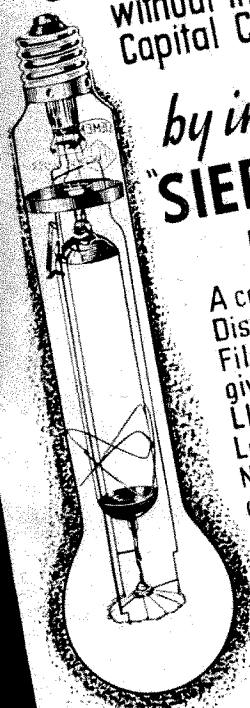
A test among several thousand typists in twenty different firms showed an increase in the speed of transcription of shorthand notes of 20.1 per cent. when illumination levels were raised to recommended standards. Assuming that this represents increased output of these workers and that they averaged £3 per week in salaries, the value of the increased production to the employer was over 12s. per week.

Good Electric Installations Have Long Life

There is one other factor, of course, that is the cost of new equipment and installation. It necessitates scrapping existing equipment in many cases. The average life of office-lighting equipment in use in this country to-day is estimated at seventeen and a half years. Such equipment has been written off long ago. Six to ten years are considered the useful life of most business equipment and might be a fair way of

(Please turn to page 34).

? How can I improve my
FACTORY LIGHTING
without incurring high
Capital Cost?



by installing
**"SIERAY-DUAL"
LAMPS**

A combination of Electric
Discharge and Tungsten
Filament in one Lamp,
giving **UP TO 50% MORE**
LIGHT than gasfilled
Lamps of equal wattage.
No choke coil, condenser
or re-wiring required.

WRITE FOR
CATALOGUE
No 534

SIEMENS

SIERAY

For the Lighting of
**OFFICES, SHOP INTERIORS,
SHOP COUNTERS, SHOWCASES**
etc.

Install
**"SIERAY" FLUORESCENT
TUBE**

It provides an illumination
approximating to natural daylight
with these advantages:
1. Light Efficiency more than
TWICE that of the ordinary
Filament Lamp.
2. Lamps have life of approximately
2000 hours.
3. Cool in operation.

FREE ADVICE WE WILL GLADLY
SEND A LIGHTING ENGINEER TO ADVISE
YOU ON A LIGHTING LAYOUT USING
EITHER

SIEMENS

TUNGSTEN FILAMENT LAMPS
"SIERAY" ELECTRIC DISCHARGE LAMPS
"SIERAY-DUAL" LAMPS

WE OFFER THIS SERVICE WITHOUT ANY OBLIGATION.

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F.T. 966.

Advt. of SIEMENS ELECTRIC LAMPS AND SUPPLIES LIMITED, 38/39 Upper Thames Street, London, E.C.4

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Although, in present circumstances, de-
livery of machines is restricted, the full
advantages of Punched Card Accounting
can be secured through the various Service
Bureaux, one of which is to be found in
every industrial area

A FULL ACCOUNTING AND STATISTICAL SERVICE
NO MACHINES TO BUY
NO STAFF TO TRAIN

For explanatory booklet, write—

THE BRITISH TABULATING MACHINE Co. Ltd.
VICTORIA HOUSE, SOUTHAMPTON ROW,
LONDON, W.C. 1

To Executives

Gentlemen,

*You do not tolerate inefficiency
and yet you probably permit*

NOISE

*the basic cause of inefficiency
in Office and Workshop.*

*BURGESS offer their unrivalled
Service in the solution of your
problem — free and without
obligation — Write now*

Burgess Products Company Ltd.
Acoustical Engineers
Hinckley, Leics.

A.R.P. for the Factory

You Can Expand Shelter Capacity with Efficient Ventilation

Humidity and Vitiated Air must be Controlled to make Shelters Available for Long Periods

THE continuous supply of fresh air is vital for the support of human life. Normally, surrounded as we are by air, the operation of our lungs is ignored. When we become enclosed in a concrete shelter with a limited space per person, the dependence of our body upon an adequate supply of air is severely brought to our notice.

Numerous occupancy tests of air raid shelters have been carried out, both by local authorities and by private research workers, with a view to gaining practical knowledge of the conditions likely to prevail when such shelters are occupied for lengthy periods. During many tests and air raid drill practices, when unventilated underground blast-proof shelters with gas-proof fittings have been used, it has been found that the occupants experience a discomforting buzzing in the ears after even so short a period as a quarter of an hour. This is due to the air becoming vitiated. Whilst at the outset this air does no harm, the condition rapidly becomes more severe and after a prolonged stay, due to the high CO₂ content, lack of consciousness would occur.

Temperature and Humidity Rises Must Be Controlled

The number of persons who can remain in an unventilated shelter for a prolonged period is, of necessity, limited. In an unventilated shelter occupied by too many people, the first troubles will not only be the foul con-

dition of the air, but the intolerable discomfort due to rises in temperature and humidity. When under normal conditions the temperature is in the region of 60 deg. Fahr., after even a short period of occupancy, say of approximately two hours, it will be found that the temperature has increased by 90 deg. Fahr. The relative humidity, which at the outset is 35—40 per cent., will increase to somewhere between 80 and 90 per cent. Anyone who has experienced such a condition for any length of time will appreciate the relief of cool, clean fresh air.

Home Office specifications show that the room volume required when a shelter is unventilated is four times that needed for a mechanically ventilated shelter. It will be seen that there is a distinct saving in building time and costs, whilst, due to the smaller size of the shelter, the danger of a direct hit is minimised.

Sound Construction Helps To Improve Morale

It has been recommended by the authorities that shelters should be designed to accommodate not more than 50 people. The total number to be housed, space available, etc., frequently decree that this number be increased. This again is another argument in favour of mechanical ventilation, because of the greater number which a shelter so equipped will comfortably accommodate.

Furthermore, the reduction in size, whilst permitting a sufficiency of space

Period of occupation	Unventilated gas-tight shelters. Ttl. surface area req'd per person	Mechanically ventilated shelters	
		Total surface area required per person if shelter is ventilated at the rate given opposite in column 4	Ventilation rate per person
3 hours	75 sq. ft.	30 sq. ft. if shelter is above ground.	450 cu. ft. per hr.
		40 sq. ft. if shelter is above ground, or 20 sq. ft., if the shelter is under ground.	150 cu. ft. per hr.
12 hours	100 sq. ft.	50 sq. ft. if shelter is above ground, or 25 sq. ft., if the shelter is under ground.	450 cu. ft. per hr.

This table shows that more than 300 per cent. increase in shelter capacity is made possible with efficient ventilation

per person for comfort, limits the number who can enter. This is important, because many people may attempt to rush into a large shelter through panic, consequently, if filled to crush capacity, there would be crowded into the shelter four times the number of people for which it was designed. The Home Office advises that, where possible, to give the utmost protection against bombs, shelters should be located below the ground surface, but as a matter of convenience, many are constructed above ground level. Psychologically, the use of any structure sufficiently sound in construction to be splinter-proof gives a confidence and improves morale.

Anti-Gas Precautions Are Aided By Ventilation

Such structures are in equal or even greater need of mechanical ventilation because of the greater necessity to make the room gas-proof, whereas the underground shelter requires ventilation, because of the inability of air to enter naturally. Ventilation is required by surface shelters to maintain a slight pressure, thereby keeping gas-laden air from entering.

Whilst air is a necessity, the amount of air required per person and how it should be supplied, varies with the site location and the type of shelter concerned, for example: Where air can be drawn in at a very high level, i.e., from more than 25 feet above ground level, it is advised that 7½ cubic feet of air per minute per person should be supplied when the ground space per person is 3½ square feet. In this case, it is not always necessary to equip the plant with gas filters, because most of the gases used in warfare are heavier than air and lie on low levels. Where air must be drawn in from a low level and the danger of gas has to be guarded against, it is advised that 2½ cubic feet of air is the supply per minute per person, allowing 6 square feet of floor space.

Dimensions of room in feet			Number of occupants when ventilation rate is		
Length	Width	Height	150 cu. ft. per person, per hour, for periods up to 3 hours	450 cu. ft. per person, per hour for periods up to	
			(Total surface area ÷ 40)	3 hrs (Total surface area ÷ 30)	12 hrs (Total surface area ÷ 50)
9	7	8	10	13	8
9	8	10	12	16	10
12	8	10	15	20	12
13	12	10	20	27	16
16	12	11	25	35	20
17	15	11	30	40	24
22	18	10	40	53	32
24	15	10	37	50	30
26	15	15	50	67	40

This table gives comparative figures of shelter capacity with varying rates of air input

Light beats the clouds, especially the clouds of depression. Good light in the workshop increases production. Instal

COSMOS & METROVICK LAMPS

in your office, your factory and your home.

COSMOS LAMPS

METROPOLITAN-VICKERS ELECTRICAL Co. Ltd., NUMBER ONE KINGSWAY, LONDON, W.C.2

Give them SAFE and DEPENDABLE ALL STEEL LADDERS.

INSTANTLY adaptable to any position, blaze and smoulder proof, these strongly made ASRO ALL STEEL Ladders may well save time, life and property and reduce risk of injury to A.F.S. workers, wardens and fire watchers. Steps are interlocked and welded; bonding straps prevent sides springing open under excessive weight. Special top hooks on to loft entrance, shelf or sill. The ASRO extends telescopically **in a moment**, is made in four sizes, finished olive green, guaranteed for five years, free of Purchase Tax. Early orders urged.

5ft. 0ins. size extends to 9ft. ...	28/6
5ft. 9ins. " " " 10ft. ...	32/9
6ft. 3ins. " " " 11ft. ...	36/6
6ft. 9ins. " " " 12ft. ...	40/-
Special shelf-bar type for Factories, Warehouses, Stores & Shops	
9ft. ... 31/3 10ft. " ...	35/6
11ft. ... 39/3 12ft. " ...	42/9

Sold by Bakers of Kensington, Timothy Whites, good Stores and Iron-mongers, or direct from makers (carriage 2/9 extra).

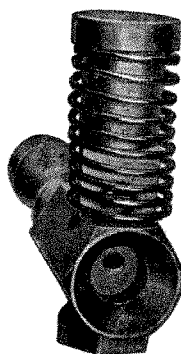
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ASH & ROGERS, BENTLEY LANE, WALSALL

ASRO ALL STEEL LADDERS

It must be SPRAY!

.... it IS spray, if your Stirrup Pump has a **WOODHOUSE "SET-SPRAY" Nozzle**



Every fire-fighter knows the danger of putting a straight jet on to a blazing bomb. Yet haste and excitement can easily cause this to happen with the ordinary nozzle. With the **WOODHOUSE "SET-SPRAY" NOZZLE** such mistakes are **IMPOSSIBLE**. The normal position gives the spray. To obtain the jet the spring must be depressed with the thumb, and immediately the spring is released the spray is again in operation.

With the Woodhouse "SET-SPRAY" Nozzle, you are **certain** to get the spray unless you want the jet.

Write for details of this and the **WOODHOUSE INCENDIARY BOMB CONTROLLER**, also of **FIRST-AID HAVERSACKS AND POUCHES**.

WOODHOUSE
PRODUCTS LIMITED

Registered Office and Works:—

108 CRICKLEWOOD LANE, LONDON, N.W.2.

Telephone: GLAdstone 7093.

W.H.B.

Production, Progress and Pay Roll Control Simultaneously

(Continued from page 20).

The foreman of each department has in his office a "Jobs in Hand" and "Jobs Ahead" rack. When the job is due for release, the set of operation tickets is taken from the file in the planning department, and issued to the works. It will be noticed that each operation ticket is numbered. These numbers indicate the order in which the operations are to be performed.

The Operation Tickets also Act as Stock Requisitions

The foreman of the department with which the first operation on the ticket is concerned, receives the operation tickets and places them in the "Jobs Ahead" rack, in the numbered pocket indicating the machine that has been allocated for the work shown by the number on the first ticket. The foreman in due course will transfer the first operation ticket to the "Jobs in Hand" rack—again in a numbered pocket indicating the machine that has been allocated for this work as shown by the number on the operation ticket.

As the operator, having received blue prints and tool list, commences operations, the time is recorded on the back of the operation ticket by a job timing recorder.

Individual Reporting Keeps Progress Record Up-to-date

On completion of the operation, after the inspection department has O.K.'d the part and filled in particulars as to rejects, the finishing time is also recorded, and the operation ticket having been detached from the master card, the operator's clock number is entered thereon in the space provided. The operation ticket is then placed in a "finished operations" box. These boxes are cleared periodically throughout the day. After inspection, each finished operation ticket is passed to the planning department, where the duplicate (marked P.) that has been filed in accordance with the system already outlined, is released from the machine loading frame. This operation ticket is passed to the progress dept., which is thus made aware of the position of the work, and the ticket is placed in the progress control board. A similar procedure is followed with every operation ticket.

The progress control board is arranged to give the utmost assistance in controlling the progress of the orders through the works. The arrangements of the progress board obviously permits many variations. One arrangement is to have a series of pockets for each component, the pockets corresponding to the different operations in their

routine order, under dates for completion of each stage. Another arrangement allows one pocket for each component. As the operations tickets are received in the progress department, they are placed in the pocket corresponding to the drawing number of the component concerned—each operation ticket for that component being placed immediately on top of the preceding operation ticket for the same component. Thus the top ticket always shows the finished operation, indicating the stage the job has reached.

Any Delay or Shortage is Immediately Obvious

The necessity for "chasers" to find out the position of any job is considerably reduced—if not entirely eliminated. There's no hurry or flurry as to whether a job is being completed on time or not. A glance at the progress board will indicate at once the position of any job in progress through the factory.

After serving its function as a means

of releasing its duplicate "P." operation ticket from the planning department to the progress control board, the original operation ticket (now complete with all details as to the quantity finished and approved, the time taken and bonus earned, against the operator's number) becomes the wages voucher, and can be immediately credited in the wages department to the operator concerned. Obviously the finished operation ticket can be used with equal facility, if the information on the ticket is the piece-work rate to be paid.

Labour Costing Gives Easy Unit Production Speed Reckoning

The operation ticket, having fulfilled its function in the wages department now travels to the cost office. At the end of the master job ticket will be seen a section ruled for the analysis of the labour cost, the cost of supervision, setting, material, breakdowns and overheads. The labour cost is arrived at by totalling the individual items of cost against each operation as revealed by the operation tickets when received in the costs office. It will be noticed that against each operation number, in addition to the time allowed and time taken, the original quantity on the order less the item shown in the scrap column, gives the quantity finished, so that minutes per unit can speedily be arrived at on reference to the time column.

Now is the Time to Overhaul Your Office Lighting Equipment

(Continued from page 30).

rating depreciation on office-lighting equipment.

In many offices the overhead lighting equipment is adequate for most needs and only requires the addition of supplementary desk lighting with the new and improved types of portable units. Since the quality of light has been largely corrected, including colour, glare and distribution, through recent developments in this field, desk lighting can solve the majority of such problems. This does away with the worry that besets many business managements in considering new lighting—rewiring and often-necessary alterations.

Cost of Current and Fittings Much Less than Savings

When all costs of such an installation are costed, it is conservative to estimate that the depreciation could not exceed ½d. per employee per day. Adding this to the power bill of 4d. we arrive at a tentative and liberal estimate of 4½d. as the total cost of supplying light to one employee for one day, or 2s. 3d. per week, as compared with an increase

in value of work done at over 12s. per week.

Good Quality Lamps are Economical in the End

Before concluding it is desirable to consider the economic relationship between the cost of lamps and the cost of light. The cost of light as we have already shown is made up of two items, namely, the cost of lamps and the cost of the current used by them, and of these two items the latter is by far the greater. It is only the very highest quality lamps which combine a long average life and the greatest light output with the least possible current consumption.* Although the initial price of these lamps may be a few pence higher than others, their performance on a light-giving basis is far superior; their maintained high efficiency and length of life mean that, for a given amount of light less current is consumed and less lamps need to be replaced. For economic reasons, therefore, users would do well to ensure that only these high quality lamps are installed.

SHANNOGRAPH

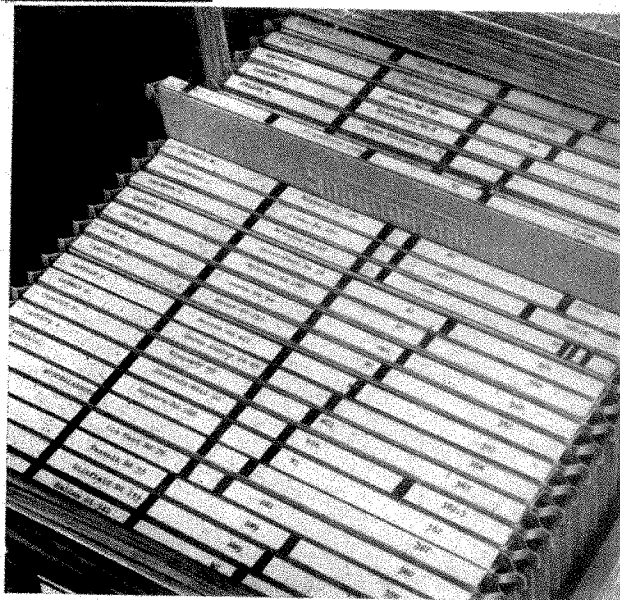
FLAT TOP FULL VISION FILING

THE MOST REVOLUTIONARY
FILING IDEA EVER INTRODUCED

- Graphic Control with unlimited applications.
- Maintains perfect filing order automatically.
- Fits any standard Filing Drawer.
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Flat Top—Fully Visible . . . Perfect Suspension . . .
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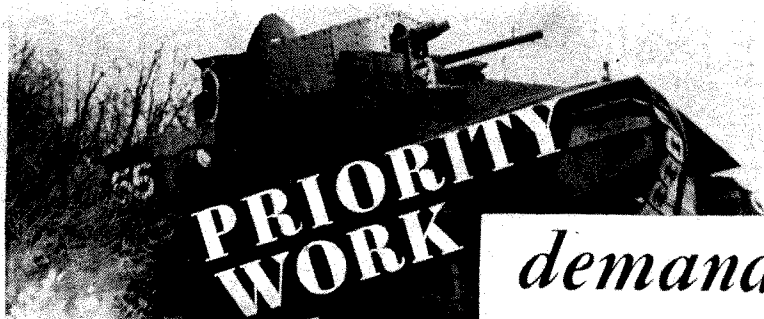


SUSPENSION

Each folder threaded with rust-proofed steel hangers which rest on metal frame inside drawer. Tops of folders are kept horizontal—the best position for rapid visual identification. Folders cannot slip under or ride up—never rest on the drawer bottom.

THE SHANNON LIMITED

Imperial House, 15, 17, & 19 Kingsway, London, W.C.2.



demands printed control

Behind the arms of to-day lies the thoughtful care and planning of skilled brains and the labours of thousands of workers. Before those ideas could be carried out into hard steel they had to be put down on paper. From the planning they passed to production and in the control of both planning and production Wilkes Industrial Printing plays its part.

Output and Planning Records, Works Order Systems, Time Cards, Piece-work Forms, Stores Records, are only a few of the hundred and one instances where Wilkes Industrial Printing enables wise management effectively to control both men and materials. For firms engaged on Priority Work we can always do just a little bit more in a little less time. Let us help you!

Send your enquiries marked "Priority" to:-

JAMES WILKES LTD. BILSTON STAFFS.

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PRINTERS SERVING TODAY'S INDUSTRY

siderably more than a ream, when lighter paper is used.

D.16 MODEL: One of the most popular models, attractively priced at 18 guineas. It is a "Rotary," with a simplified form of self-feeding and has all the advantages of speed, simplicity, variable and balance pressure and is fitted with a counter.

COLOUR PRINTING: This machine can be supplied with two cylinders which are easily interchangeable from one colour to another.

EVERTAUT LIMITED, Walsall Road, Perry Barr, Birmingham, 22.

STEEL WORKS SEATING: over 20 models. Triangulated "L" steel frame; patented locking-box keeps legs perpetually taut; tightened by adjustment of single nut. Wood or upholstered seats, with or without backrests; adjustable, or in range of six fixed height seats.

WALL SEAT: automatically folds back flat against wall when not in use. Suitable for machines, lifts, cinemas, chain-stores, large shops, etc.

BENCH SEAT: multi-purpose seat for fixing to bench, work-table or machinery. Device allows quick adjustment. Varnished seat, metal surround, can be swung away under bench.

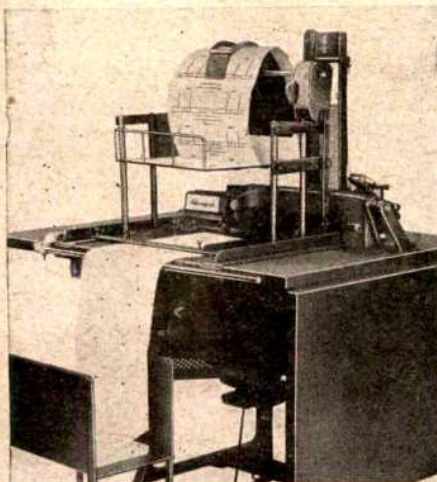
STACKING CHAIRS: steel; special type for canteen use. 20 chairs can be stored in space of one. Using stacking chair trolley, 500 chairs can be cleared in about ten minutes.

OFFICE POSTURE CHAIRS: EXECUTIVE CHAIRS: "County" class office posture chairs in three styles—Worcestershire, Warwick, Westmorland; adjustable backrest and height. Executive and managerial use: "Chairman" model. Adjustable height; silent, safe tilt.

See announcement on Cover ii.

FANFOLD, LTD., North Circular Road, London, N.W.2.

FANFOLD TABULINER: one of the latest products of this company. That continuous stationery has greatly speeded up all forms of progressive typing is an accepted fact, and especially has it still further increased the scope of certain



The Fanfold Tabuliner

types of machines such as high-capacity tabulators.

The Tabuliner, however, has now been introduced to control the continuous forms. It is a simple device which accurately aligns the forms, by means of only

two aligning holes, and feeds them automatically through the tabulating machine. It requires no alteration to the machines or platens—does not interfere with the use of cut forms when occasion requires—and may be attached or removed quickly. It will control and align any number of copies which the tabulating machine itself will handle.

SIMPLI-RITE: means just what it says; it refers to a neat-looking manifold register using Fanfold forms. Carbons are retained in a locked compartment. Also other types of registers, including—

THE CASHIER, in which is incorporated a compartmented cash-till. All these registers are of very fine appearance.

CARBON SNAP-OUT FORMS: multicarbon business forms with inexpensive carbon paper already interleaved, supplied in sets with carbons and forms secured at stub. After typing, the forms are snapped apart—carbons remain affixed to stub—forms loose. Forms which require additions may be left with carbons affixed for subsequent typing.

SPEEDFORMS: specially devised for use on standard typewriters and accounting machines. Used with Fanfold Speed-o-form attachment (which can be put on and off the machine in 5 seconds) the user has the economy of continuous-form typing without the purchase of expensive equipment. Claim is that an operator can give 50 per cent more output with less fatigue with Speed-o-form.

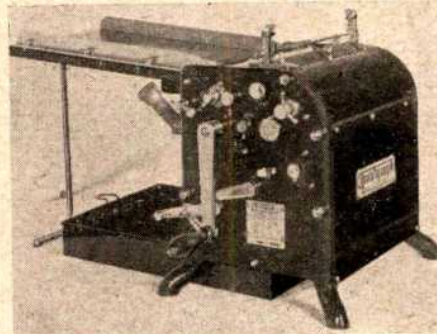
See announcement on page 42.

FRANK R. FORD LTD., Sydenham Road, Sparkbrook, Birmingham, 11.

THE FORDIGRAPH REPRODUCER: there are models to meet every requirement where multiple copies are needed. Chief details of machines: (1) low cost for production of any first copy; rock-bottom cost for runs up to 300 copies; (2) mode of operating eliminates need for stencils, ink, or special paper; (3) no preparation or cleaning, before or after use, required; (4) produces in one to five colours in one operation; colours permanent, fast to light, heat, oil and water; (5) any kind, size, shape or thickness of paper may be used; (6) finest details of architectural or engineers' drawings, charts, maps, plans, graphs, etc. successfully reproduced; (7) exact registration obtained when working on printed forms; (8) alterations made on "original" as easily as on typed letter; (9) no smudging, blurring or creasing of "originals" or reproductions possible when operating machine; (10) simple to operate; junior can be left in charge; (11) copies all or any desired section of information; (12) original data copied immediately or year later.

FORDIGRAPH JUNIOR ROTARY REPRODUCER: This is a new model recently produced specially and specifically for the time being for the export markets. Whilst not so large in dimensions as the standard model the results obtained from it are equal in all respects, it has many outstanding features, and has the capability of dealing with the many classes of work which the standard model can cope with in that it is able to reproduce up to the maximum size which the standard model can cover, namely 9 in. by 13 in. Reproductions can be made on either the long or short way of the paper of these dimensions, and it is equally easy to do reproductions of post card size on this machine.

FORDIGRAPH-SYSTEMEX REPRODUCER: This is an entirely new model also produced this year and it provides for an accurate, economical, and flexible routine system for production. It permits of material requirements, operation tickets, progress slips, cost cards, and routine sheets to be obtained from the one "Fordigraph" original or master sheet. The Systemex machine provides in an automatic manner the reproduction of all particulars relative to each individual operating on to separate and individual operating tickets, besides transferring the name of the part and its number, with the description of the material, order number, date, and such other details as may be



The Fordigraph Reproducer

required. Elimination of any part of the original or master by the process of tearing or masking is not necessary.

FORDICRIMP: for simple binding together small or large number of papers.

FORDILITE: ensures for typist perfect visibility on writing line; can be fitted to any make of machine.

FORDISTELE: quality range of all steel furnishing requisites.

See announcement on page 49.

GLEDDHILL-BROOK TIME RECORDERS LTD., Empire Works, Huddersfield.

TIME-RECORDERS: printed time records of attendance, labour costs, machine hours or transport; for use in office, factory, warehouse, shop, etc. Many models available; feature is "the Clipper" mechanism, designed for costing and time-keeping; device clips piece from card each time the card is inserted for time-recording; clip allows card to drop step lower at next registration. Clipper model used for (a) time-recording; (b) jobcosting, (c) both, (d) recording time machine run and idle hours.

SYNCHRONOUS MOTOR-DRIVE MODELS: fitted with G.B. synchronous motor-drive; enables recorder to be plugged into electric supply; no master clock needed to give power-impulse.

DESK AUTOGRAPHS RECORDER: is special model for salaried staffs; signature machine.

UNIVERSAL PORTABLE RECORDER: replaces time-stamps, functions as time-recorder; registers time on sheet or card, any size, by depressing table on which document rests; can be used for timing receipt, dispatch of letters, etc., start and finish of jobs or straightforward time-recording. Various other models also available.

See announcement on page 41.

HUNTER PENROSE LTD., 109 Farringdon Road, London, W.C.1.

PAPER ECONOMISING MACHINERY: Waste paper baling presses; "Economic" paper shaving machine.

(Please turn to page 38).



"One question, Mr. Jenks—are you satisfied that every machine tool now in the shop is producing to its potential maximum?"

In other words, have you Kardex-control of raw materials, production capacity and progress guiding the work smoothly from process to process without waste of a single machine-hour?

Many leading firms have already proved the true economy of installing this system 'machine-tool' before embarking on the much more expensive course of installing shop machine tools.

Moreover, making (with the aid of Kardex) the fullest use of their precious plant, they are serving the national interest by increasing their output and reducing their demands for machine-tools.



Please send for Brochures, which will give convincing details of our claims, to

Dept. 353, KARDEX VISIBLE CONTROL SYSTEMS
1, New Oxford St., London, W.C.1. Tel.: CHAncery 8888.



GOOD WORK? . . . After wasting 4 solid hours!

Miss Jones is just as anxious to do a useful job as you are to have her help out with one. BUT with the way the office is organised now she has to waste hours each day . . . taking shorthand dictation.

WASTE? Of course . . . when the whole out-of-date process could be eliminated by using the Ediphone. If her chief needs 4 hours to dictate his reports, let him take 4 hours of Ediphone's time. And let Miss Jones put in 4 hours helping you on a REAL job. In fact, with working hours shortened day staffs reduced by war-time, many office managers are proving Ediphone to be a vital part of the staff . . . freeing the workers for the money-making tasks. Wouldn't that help to solve your problems?



Everybody's time is more valuable now—and the Ediphone helps to save time all round. Let it help you. May we demonstrate—in your own office? You incur no obligation.

For recording telephone conversations, board room conferences, minutes of public meetings, speeches, etc., use the TELEDIPHONE.

EDIPHONE SYSTEM OF
Voice-Writing

THOMAS A. EDISON, LTD.,
Victoria House, Southampton Row, London, W.C. 1
Telephone: Holborn 9988

BRANCHES AND DEALERS IN ALL PRINCIPAL CITIES

GUILLOTINES, CUTTERS ETC.: the "New model" extra heavy cutter will cut paper, strawboard, cardboard, celluloid, mica, gelatine, thin leather, zinc and brass, canvas, metal foil and similar materials. The knives are of finest Sheffield steel, and are nearly twice the thickness and depth of those usually offered, thus rendering longer service and greater precision in cutting. All sizes, except the 12-inch, are fitted with an efficient (foot-operated) clamp for holding the work; this clamp is secured at both ends of the cutter, ensuring a firm and even pressure. On the 12-inch size a clamp is unnecessary, owing to the small size of the work.

"H.P." bench model guillotine is made in two sizes, for use in small printing offices, stationers, banks, and insurance companies, and offers a very ready means of trimming, or cutting to size, printed matter, stationery, etc. The knife-holder, to which the knife is attached by means of screws, is fitted on to two eccentric studs, so that, when the knife is worn by continued grinding and during use in its original position as dispatched from the factory, it can be given a further lease of life by turning the two eccentric studs in question, which will lower the knife-holder and blade.

IMPERIAL TYPEWRITER CO., LTD., (Address on application to Editor of BUSINESS).

TYPEWRITER, "QUIET" MODEL NO 55 is latest development in Imperial range. In addition to rear - silence in operation the machine is adjustable as to touch. Thumb screw on tension plate enables operator to adjust to his or her exact liking. New bail bar prevents any marking of carbon copies by the feed-rollers. The paper table tilts forward, making far easier the adjustment of margins and access to tabulator stops. Ribbon spools are dust-proof with hinged tops. Keyboard is non-glare. Colour change, with 2-colour ribbon, is faster and more positive. Five carriages, from 12in. standard to 26in. in width are available.

See announcement on page 43.

INTERNATIONAL COIN COUNTING MACHINE CO., LTD., College Rd., Cheshunt, Herts.; Showroom and Service, 133-41 Rosebery Avenue, E.C.1.

H₃ COIN - OR TOKEN-COUNTING machine, electrically operated, counts and records on the indicator. Automatically stops when required number of coins have been counted. Experienced operator can fill 350 bags of 60 pennies each in one hour, or make a continuous count of 60,000 coins an hour.

H₅ COUNTER: similar to above but with spinning gear for packeting coins into rolls.

TYPE J; similar to H₃ but hand-operated.

TYPE JW: Similar to Type J but is for counting 2s. 6d., 2s., 1s., 3d., 1d., and 1d. It stops automatically at £5 silver and 5s. copper. This machine is particularly valuable in wages' depts.

K₁ to K₄ COIN SORTERS operate up to a sorting speed of £3,500-£4,000 per hour.

"RAPID" ENVELOPE OPENER: for the mail-room, electrically operated Type E₃ has capacity of 1,000 letters per minute. Hand-operated E₅ has a speed of 500 per minute.

"RAPID" ENVELOPE SEALING MACHINE: electrically operated, speed up to 20,000 envelopes per hour. Will take envelopes of all thicknesses and sizes.

Perfect sealing is obtained by electrically heated water which is maintained at an even temperature by an automatic switch. The machine is driven by universal motor through a reduction gear box, thereby eliminating the use of driving belts.

See announcement on page 41.

INTERNATIONAL TIME RECORDING CO. LTD., Beavor Lane, Hammer-smith, W.6.

SUPERELECTRIC TIME RECORDER: introduced at the beginning of the war, is proving popular because of—

1. Speed of registration: no printing lever or hammer to press: record is made instantly on insertion of card.
2. Accuracy and clearness of record:



The International Super Electric Time Recorder

always in correct positions on card.

3. Streamlined appearance: no projections anywhere.
4. Record on front of card.
5. Effective direct-read indication of the hour and minute on the front of the machine.
6. Electrical control of all operations, including time indication, time recording, and time signalling, (no winding or regulating).
7. Automatic operation of 2-colour device (blue for regular time, red for lost and overtime).
8. Efficiency of 'IN and OUT' positioning, day to day alignment, and colour changes (these can all operate now at minute intervals).

INTERNATIONAL TRIGGER-PRINT JOB TIME RECORDER: incorporates features of the International electric model EMC 1008 job time recorder but eliminates necessity for handling any printing lever, record of the time of commencing and finishing jobs being made immediately on insertion of card—any number of records being possible on one card.

INTERNATIONAL HEKTO-WRITER: used in conjunction with liquid duplicating machines results in not only clearer and cleaner work, but also in such saving cost of carbon paper that this feature alone more than pays for the equipment within a few months.

INTERNATIONAL ELECTRIC BILLING MACHINE: enables fullest advantages to be got out of continuous stationery. As many as 20 carbon copies of an invoice, work instruction sheet, or similar forms, can be obtained with (it is

claimed) less effort than a typist usually expends on one copy with an ordinary machine.

INTERNATIONAL TICKETOGRAPH: Gives control of steps in production including planning, stores requisitions, progress, labour costing and pay roll control. The machine prints simultaneously on all individual job tickets and on the master job ticket.

See announcement on page 43.

PERCY JONES (TWINLOCK) LTD., Twinlock Works, Beckenham, Kent.

MACHINE ACCOUNTING EQUIPMENT: manufacturers of Twinlock loose leaf books have designed equipment called Post Haste. Device provides for accounting machinery need of front feed; sheets have unbroken edge; feeding-edge devoid of punching, etc.

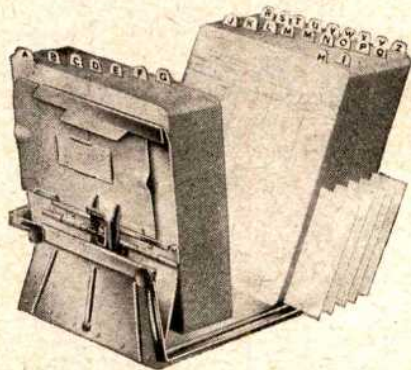
RUBBER-BOUND BOOKS: rubber-edge feature now incorporated in Twinlock line. Consists of dovetailing, on wearing edge of covers; a thick rubber tread; protects desk, prevents damage to binders.

THONG LEDGERS: Vulcan Thong binder for ledgers and books. Sheets added or removed quickly; lies flat upon desk, gives every sheet flat writing surface; minimum holding capacity, one sheet. Another thong binder is Sentinel, used where something not so fine as Vulcan is required.

STEEL-BACK LEDGERS: Twinlock Capacity Plus allows withdrawing from covers of leaves *en bloc*, together with posts, in a moment; great advantage when sheets inserted or removed; perfect alignment.

VISIBLE RECORDS: Visible Indexing; thousands of items of important data stored in visible binders, yet available for instant reference.

NEW TWINLOCK POSTING TRAY: In addition to a comprehensive range of loose leaf equipment, this firm have produced a new machine posting tray. The new equipment represents a smaller unit of the light "inset" variety, trays which



The New Twinlock Posting Tray

are portable and light to enable an operator to lift them easily from the safe cabinet to the machine.

The design presents new features. The cards are supported at the sides by plated steel bars, which are readily adjustable to cards of various widths. When in use these bars drop completely out of the way. The full view of the cards thus obtained and the ease with which the posting media can be inserted or withdrawn can be seen from the illustration. Both sides of the tray have these adjustable bars, so that offsetting to the left or right is available if desired.

See announcement on page 47.

(Please turn to page 40)

THE NAVY WON'T STAND FOR SHRINKAGE. WHY SHOULD YOU?



THE Diesel engines of a submarine are placed on both sides of the central alleyway in the ship. The men who tend them are well protected in overalls that can't get too short in the legs or arms. That's because the cloth they are made from is mechanically shrunk so that no appreciable further shrinkage can occur.

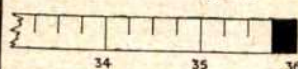
FOR many jobs overalls are worn by the Navy now just as they are by the other Services.

Naturally, in the Navy, even overalls must be smart — must fit well, must be comfortable, must stand up to hard service. So a first essential for Navy overalls was — the cloth must not shrink.

No vague claims of unshrinkability were good enough for the Admiralty. They set a standard of shrinkage tolerance. It is a high one. It allows for no more than $\frac{1}{2}$ of 1% shrinkage in length or 2% in width.

Uncontrolled shrinkage treat-

Compare these diagrams



Overall cloth that is "Rigmel". Shrink won't shrink by more than a negligible fraction in the yard.



Some so-called "shrunk," "fully-shrunk" and "guaranteed unshrinkable" overall cloths shrink by as much as 2 inches in a yard.

ments cannot comply with Admiralty standards. Some leave as much as 2 inches of shrinkage in the yard. See the difference between them and "Rigmel" mechanical shrinkage on the diagram below! No wonder mechanical shrinkage is wanted by the Navy!

Why not let your workers have overalls that are up to Navy standards in terms of non-shrinkage? They don't shrink, they offer better protection, they look smarter, they keep their fit and comfort and they wear longer. Usually the cost of "Rigmel" shrinkage is paid by what you save on overall replacements and repairs alone. And it is well known that the output of workers improves when they are smartly and comfortably clad.

Most suppliers have "Rigmel". Shrunk overall cloth. Protective garments made from it are available through retail outlets for purchasers of small quantities.



"Rigmel"-Shrunk Laundry-tested against Shrinkage
REGD.

Advertisement of THE BRADFORD DYERS' ASSOCIATION LIMITED
LONDON · BRADFORD · MANCHESTER

Don't Black out the SUN



Sunshine produced every H.P. of energy used in your factory (scientific fact!). And sunshine produces all the energy your workers put into their job. Sun-starved people are never 100 per cent. well. We are approaching winter after a sun-starved summer, and the war effort (cut-down holidays, shortened sleep, over-time, blacked-out factories and all that) means over-strain for unfit people. These things raise sickness, absence and accidents but lower wages and output.

Don't black-out the Sun! Install Hanovia Welfare Sunlamps at the Works and give your people vitalising sunbaths. (Take them at home yourself if you like with a "Homesun"). Brief regular sunbaths with these Hanovia lamps are keeping workers fighting fit; have lowered illness and absence by 30 to 40 per cent. (actual records!).

"This war will be won in our work-shops," says Mr. Bevin—and Hanovia Sunlamps are helping the Fighting Units and factories of Britain to make the winning effort.

We offer our booklet "Fitness in Industry" freely to employers, factory Medical Officers and Welfare Supervisors. Send for your copy now.

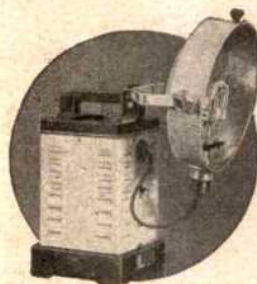
The Industrial Welfare Department,
HANOVIA LTD., SLOUGH.

London Showrooms: 3 Victoria Street, S.W.1.

Hanovia Sunlamps are helping in the war work of:

Armstrong Siddeley Motors Ltd.
Aspro Ltd.
Bell's Asbestos & Eng. Co. Ltd.
Birmetals Ltd.
Blackburn Aircraft Ltd.
Montague Burton Ltd.
Cadbury Bros. Ltd.
Crompton Parkinson Ltd.
Daimler Co. Ltd.
Electrolux Ltd.
Ford Motor Co. Ltd.
General Aircraft Ltd.

Glasgow City Police
Arthur Guinness Son & Co. Ltd.
Hadfields Ltd.
Harland Engineering Co. Ltd.
H. J. Heinz Ltd.
Alfred Herbert Ltd.
Hercules Cycle & Motor Co. Ltd.
Alfred Hughes & Sons Ltd.
H.M. Navy
(Several ships and shore depots).
I.C.I. Ltd.
John Mackintosh & Sons Ltd.
McVitie & Price Ltd.
Mainsforth Colliery.
Manchester Collieries Ltd.
Manvers Main Colliery.
Marconi Wireless.
Mardon, Son & Hall.
Marks & Spencer Ltd.
Metal Box Co. Ltd.
Monotype Corporation Ltd.
Old Bleach Linen Co. Ltd.
Ollerton Colliery.
Oxo Ltd.
Pressed Steel Co. Ltd.
R.A.F. Squadrons.
Rowntree & Co. Ltd.
Royal Arsenal, Woolwich.
A. Sanderson & Sons Ltd.
Standard Telephone & Cables Ltd.
Tullis Russell & Co. Ltd.
Unilever Ltd.
Whitrigg Colliery.
Wolseley Motors Ltd.



The Hanovia Welfare Sunlamp for tonic ultra-violet sunbaths indoors.

COUPON To: Industrial Welfare Dept.,
HANOVIA LTD., SLOUGH, BUCKS.

Send me facts about indoor tonic sunbaths
(Required for employees)
(Required for personal use)

Name

Address

H118/495.

KALAMAZOO, LTD., Northfield, Birmingham, 31.

STANDARD LOOSE-LEAF EQUIPMENT FOR PEN-POSTING: a wide range of types and sizes, literally exemplifying the slogan "A book for every purpose." Kalamazoo has a sheets library of some 100,000 different rulings.

An important feature in connection with the loose-leaf system is the new and ingenious storage binder range. It is no longer necessary to remove sheets from one's second stage of storage in order to put them in permanent storage form. The back cover of the second-stage binder, complete with all its contents, is simply removed and a permanent cover fitted. For many purposes it will be realised what a great saving of time is represented by this new facility.

VISIBLE RECORDING EQUIPMENT: two main types—one for actual recording and the other for strip indexing. Both these forms of visible equipment are in book form, and it is claimed that they take up one-third of the space and cost one-third the price of the steel cabinet forms of visible equipment.

MACHINE ACCOUNTING EQUIPMENT: the machine accounting section of the Kalamazoo range includes several distinct types of containers for machine accounting cards. The various types fall into two broad categories:

- (a) Tray-container type.
- (b) Binder type.

In the first category are included not only the more normal insert-trays, but also Kalamazoo Card-Fast which ingeniously tips the cards in their container from a vertical position for reference and posting to a horizontal position for efficient storage.

KALAMAZOO "COPY-WRITING": Many of the advantages of mechanical accounting are incorporated in "Copy-Writing" and some firms have installed it as a stand-by in case their machines are damaged, so ensuring the continuity of their accounting routine.

It permits the introduction of collection of Income Tax at source. "Copy-Writing" prepares the earning record, pay slip and pay roll at a single operation.

See announcement on page 27.

KARDEX DIVISION, LIBRARY BUREAU LTD., Commonwealth House, 1 New Oxford Street, London, W.C.1.

VISIBLE RECORDS: Full range of equipment giving speedy operation and visual control to materials, supply and

parts stock records; production planning, progress and control; personal records; contract and sales records, follow-up etc. The wartime drive for efficiency has greatly increased the demand for this type of equipment and service; the Kardex staff of record consultants has been working to capacity, and their advice and suggestions are available without obligation.

THE SIGNAL COLOUR CONTROL feature of Kardex has been extended. Simple error-proof, yet efficient signalling plans are now available which enable complete control to be maintained with the minimum of clerical work.

GRAPHIC LAY-OUT: This range has been developed, especially for production control. War difficulties have forced factory managers to adopt more accurate methods of controlling work allocated, work done, and materials, position, etc., and these Kardex devices have been widely applied. Four types are available: the slotted chart—a metal panel to which coloured signals and designations are clipped, giving a flexible graphic medium; the horizontal planner—for machine loadings; the vertical planner—for controlling contracts and programmes; and the colourgraph—a device which projects three bands of colour over scales.

KARDEX EQUIPMENT covers four main types: the original Kardex visible record hand entry principle; vertical visible specially adapted for machine entry; Linedex, a visible strip indexing method; planners for graphic display and control.

See announcement on page 37.

KEMCLO MANUFACTURING CO., 55, Netherwood Street, London, N.W.6.

Manufacturers of the "Kemclo" factory and works stool, which can be supplied with or without back rest. Special features of this stool, which is available in two sizes, are all metal construction; locker compartment under seat (hinged to form cover), while it can be constructed and made to customers' own heights and suggestions.

See announcement on page 48.

KODAK LIMITED ("RECORDAK" DIVISION), Adelaide House, King William Street, London, E.C.4.

'RECORDAK' MACHINE: has been specially devised to deal with modern accounting and record keeping problems,

applies the photographic method of recording information on miniature film.

By the simplest of operational methods, that of feeding documents into a chute by hand, this silent running, motor-driven machine enables photographs of documents to be taken at high speed. The copies of cheques, drafts, certificates, warrants, receipts, insurance policies, invoices, etc. are made on film 16 mm. wide by means of a camera inside the machine. The only limiting factors on document sizes are the width and thickness—the length is immaterial.

The average space occupied by a "Recordak" spool of film is approximately 1 per cent. of that required for storage of the original documents photographed.

See announcement on page 44.

KORES MANUFACTURING CO. LIMITED, West Road, London, N.17.

"PLANUM" CARBON PAPERS: Specially treated to outlast ordinary carbon papers. They do not curl, and give lasting, clear copies.

See announcement on page 41.

LAMSON ENGINEERING CO. LTD., 6/8 Hythe Road, London, N.W.10.

LAMSON TUBE-WAYS: pneumatic tube systems for instant and positive communication between any number of points, almost any distance apart, carrying cash, documents, files, small parts, tools, etc.

LAMSON WIRE-WAYS: overhead wires, basket carriers, small electric and hand lifts, etc., for the speedy transit of cash, invoices, correspondence, etc. A patented Lamson system for automatic "pick-up and delivery" of documents and files in commercial offices, "proofs" and editorial matter in newspaper offices, etc.

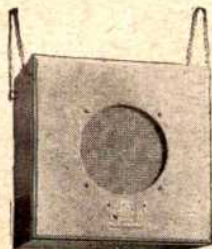
LAMSON GOODS-WAYS: mechanical handling of all kinds: gravity conveyors, slat conveyors, belt conveyors, chain conveyors, scraper conveyors for boiler houses, stackers, dairy conveyors, laundry conveyors, etc. spiral chutes, goods lifts, elevators, packing tables, portable cranes, etc.

MILNERS' SAFE CO. LTD., 21 Hampstead Lane, Highgate Village, London, N.6.

Manufacturers of: safes, strong rooms, steel office and factory equipment, including filing cabinets, cupboards, card index cabinets, desks, tables, lockers, storage shelving, bins, &c., &c., also steel rolling shutters.

See announcement on page 43.

(Please turn to page 42).



Box-type factory speaker

ROOF-SPOTTERS

**INSTANT ACTION . . .
GREATER SAFETY . . .
IDEAL WARNING SYSTEM**

* Under present conditions, we can only cater for those firms engaged on Government work.

This installation gives the perfect way of transmitting the Roof-spotter's warning and also announces the return to work with the minimum loss of time. The same installation broadcasts music, a wonderful antidote to fatigue, and will locate any executive urgently required. Information, demonstration, survey, estimates, or rental terms—free on request. Twenty-five years' experience at your disposal in manufacture, installation and maintenance. A test gladly arranged at your own works.

DICTOGRAPH SOUND INSTALLATIONS

(Dictograph Telephones Limited)

ABBEY HOUSE, WESTMINSTER, S.W.1. Abb 5572 (3 lines).

**CONTROL OF STAFF DURING AIR RAIDS · MASS
ADDRESS TO EMPLOYEES · ACCIDENT, FIRE
BURGLAR AND SABOTAGE ALARMS · AIR RAID
WARNING DETECTOR · STAFF LOCATION
AND MUSIC IN FACTORIES**

Branches at BIRMINGHAM · MANCHESTER · GLASGOW · LEEDS · NEWCASTLE · BRISTOL · CARDIFF



The daily task—the common round becomes a pleasure when **PLANUM** is used.

This modern Carbon Paper with the specially treated white back **WILL OUTLAST** any ordinary Carbon
It **WILL NOT CURL** and gives **BEAUTIFUL COPIES**



PLANUM

British Patent No. 496011.

Perfection is not so much an achievement as a pursuit. In the Kores Laboratory raw materials are carefully checked and every manufacturing process planned to the last detail. **PLANUM** is an outstanding result of our careful research and long experience

Insist on **PLANUM** and ensure
QUALITY and **ECONOMY**



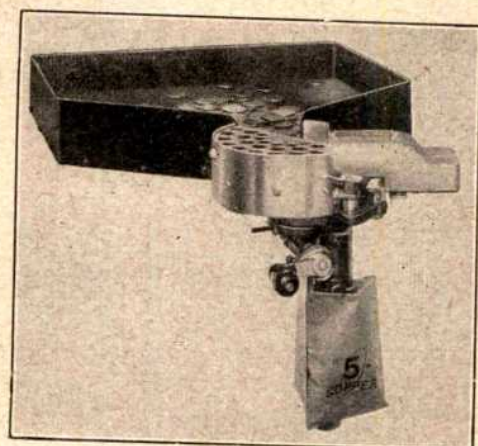
Sole Manufacturers—

KORES MANUFACTURING COMPANY LTD.
WEST ROAD, LONDON, N.17.

Tel.: Tottenham 5277/9

CANTEEN MANAGERS!

This Machine COUNTS for you



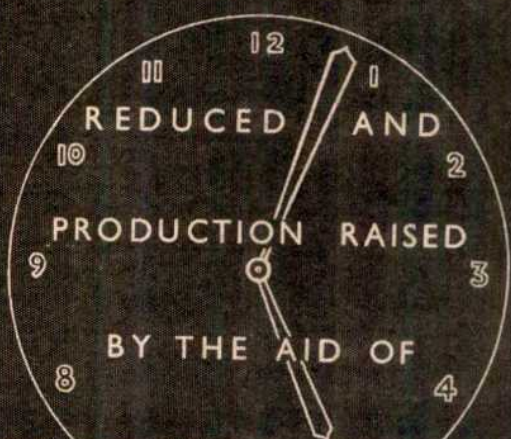
Type J
For counting Pennies or Tokens

SPEED with ACCURACY
at the rate of 1,000 coins per minute

Further particulars from :

**INTERNATIONAL COIN
COUNTING MACHINE CO. LTD.**
COLLEGE ROAD,
CHESHUNT, HERTS.
Phone: WALTHAM CROSS 3241/2.

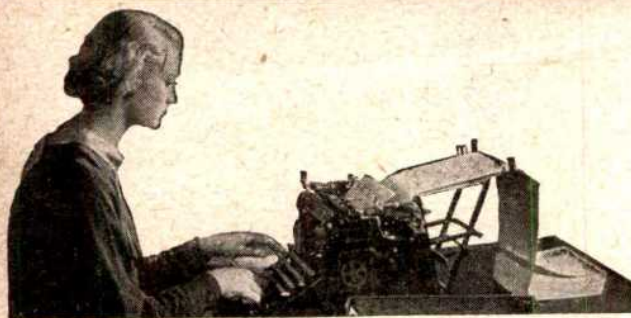
WASTE IS



GLEDHILL-BROOK TIME RECORDERS

Write for details of equipment and service, Dept. 38

GLEDHILL-BROOK TIME RECORDERS LTD
Empire Works
Huddersfield



FANFOLD CONTINUOUS STATIONERY

33 $\frac{1}{3}$ % SAVING of TIME

PERFECT REGISTER between all FORMS

FOOL-PROOF OPERATION

Fanfold Continuous Stationery enables you to eliminate all unproductive operations—insertion and extraction of Carbons, etc., etc., and so saves 33 $\frac{1}{3}$ % time, typing Invoices, Works Orders, Records, etc.—an important factor in these days of staff shortage.

No special typewriters are required, neither have alterations to be made to existing machines; perfect registration between all copies in set of forms is assured.

So successful and so great is the demand for Fanfold Limited's Fanfold Stationery that our Presses are now on 24-hour shift basis, but we can still supply you with Fanfold Continuous Stationery

WRITE FOR FULL PARTICULARS TO:



NORTH CIRCULAR ROAD . LONDON . N.W.2

Telephone : GLAdstone 5477 (4 lines). Telegrams : UZEFANFOLD GOLD, LONDON

MOORE'S MODERN METHODS LTD., 19/21 Farringdon Street, London, E.C.4.

LOOSE-LEAF RECORDS: Many new rulings are available including forms rendered necessary by official regulations, e.g. ration registers, A.R.P. records, Home Guards records, as well as salaries and wages books, providing for the deduction of income tax at source.

MACHINE ACCOUNTING EQUIPMENT: A new steel card tray of large capacity. This new "Super-Fleet" tray provides the maximum inside working capacity within the limit of its outside dimensions.

THE NATIONAL CASH REGISTER CO. LTD., 206-216 Marylebone Road, London, N.W.1.

ACCOUNTING MACHINES: The well-known National accounting machine, Class 3,000, embodying the full automatic keyboard and typewriter keyboard, is in use in large numbers of armament shadow factories, and in firms supplying equipment for the Forces. Limited deliveries are being made to essential priority industries.

The new Class 2,000 posting machine, which was announced just prior to the war, has aroused considerable interest. Some of the unique features and advantages with which this machine is equipped are:

- (a) All records (i.e., ledger, statement, or duplicate statement, and journal sheet) are in original ribbon prints.

- (b) There is no tabulating carriage.
 - (c) All records are automatically aligned. Simplicity and speed of alignment are common to several machines, but this is the first time that *automatic* alignment has been provided.
 - (d) The machine is capable of a wide automatic analysis while posting sales by areas or main groups.
 - (e) The posting speed of the machine is definitely greater than any previous machine available.
- See announcement on page 8.

OMARO LTD., 104 High Holborn, London, W.C.1.

SLIDE RULE CALCULATORS: a wide range of wage calculators which are really ready reckoners brought into a practical form and are more handy than tables normally used. By a simple movement all related values appear. There is no tricky manipulation and nothing to get out of order. All models give the following information:

- (1) Weekly wages for 47, 48 and 52 hours;
- (2) Wages for all the intermediary hours from 2—46;
- (3) Wages for the fractional hours of $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$, $4\frac{1}{2}$, $5\frac{1}{2}$, $6\frac{1}{2}$, $7\frac{1}{2}$, $8\frac{1}{2}$, $9\frac{1}{2}$, $10\frac{1}{2}$, $11\frac{1}{2}$, $12\frac{1}{2}$, $13\frac{1}{2}$, $14\frac{1}{2}$, $15\frac{1}{2}$, $16\frac{1}{2}$, $17\frac{1}{2}$, $18\frac{1}{2}$, $19\frac{1}{2}$, $20\frac{1}{2}$, $21\frac{1}{2}$, $22\frac{1}{2}$, $23\frac{1}{2}$, $24\frac{1}{2}$, $25\frac{1}{2}$, $26\frac{1}{2}$, $27\frac{1}{2}$, $28\frac{1}{2}$, $29\frac{1}{2}$, $30\frac{1}{2}$, $31\frac{1}{2}$, $32\frac{1}{2}$, $33\frac{1}{2}$, $34\frac{1}{2}$, $35\frac{1}{2}$, $36\frac{1}{2}$, $37\frac{1}{2}$, $38\frac{1}{2}$, $39\frac{1}{2}$, $40\frac{1}{2}$, $41\frac{1}{2}$, $42\frac{1}{2}$, $43\frac{1}{2}$, $44\frac{1}{2}$, $45\frac{1}{2}$, $46\frac{1}{2}$, $47\frac{1}{2}$, $48\frac{1}{2}$, $49\frac{1}{2}$, $50\frac{1}{2}$, $51\frac{1}{2}$, $52\frac{1}{2}$;
- (4) Overtime at time and third or time and quarter for $\frac{1}{2}$, $\frac{3}{4}$ and all whole hours from 1—12;
- (5) Overtime at time and half for $\frac{1}{2}$, $\frac{3}{4}$ and all whole hours from 1—12.

See announcement on page 4.

POWER-SAMAS ACCOUNTING MACHINES LTD., Yew Place, Farnham Royal, Bucks.

PUNCH-CARD ACCOUNTING MACHINE AND EQUIPMENT: The following range of machines covers the needs of small and large organisations:—

POWERS-ONE using a small card of 21 columns medium sized.

POWERS-FOUR using a card of 36 columns.

POWERS-SAMAS using a large card of 65 to 130 columns.

Powers methods enable considerable economies to be realised both in staff and time and are, therefore, of outstanding interest at the present time. The perforation of the punched cards is the only manual operation of the system and this can be efficiently performed by junior female staff after a short period of training. All subsequent operations of producing the accounting and costing records are performed by the machines at machine speed and with mechanical precision.

RELIANCE TELEPHONE CO., LTD., 39-41 Parker Street, W.C.2.

RELIANCE LOUD-SPEAKER TELEPHONES enable you to communicate with any department by merely throwing a key and speaking, without having to hold the telephone. Thus both hands are free to handle papers, etc., during conversation.

LOUD-SPEAKING, NON-DIALLING TELEPHONES: The convenience which busy executives find in a private automatic telephone system becomes even more marked if loudspeaking telephones are installed.

REMINGTON ACCOUNTING MACHINES, Commonwealth House, 1-19 New Oxford Street, London, W.C.1.

REMINGTON MODEL NO. 20: a typewriter especially for accounting work. (Please turn to page 44).

MILNERS' SAFES

in Air Raids

The following is typical of hundreds of letters in our files:

"With regard to the Safe you recovered from our late offices, we understand it is capable of renovation and shall be glad if you will put same in hand. What about the older Safe you opened? Would you advise us to have that renovated also?"

May we congratulate you on the manner in which your Safes preserved their contents. Out of five Safes, the two made by your firm are the only ones that stood the severe test. They preserved their contents admirably."

The original letter can be inspected by responsible persons

CONSULT US ON YOUR SECURITY PROBLEMS

MILNERS SAFE Co. Ltd.

21, HAMPSTEAD LANE, LONDON, N. 6

Telephone: MOUntview 6655

Profitable All-the-Year-Round Publicity at a Low Cost per Prospect



The restrictions which paper rationing has imposed on all forms of advertising make the "System" Desk Calendar a more valuable, effective and economical publicity device and goodwill builder than ever before.

Plan Your 1942 Publicity NOW

Your name or advertisement can be specially overprinted on each of the Daily Sheets of the "System" Desk Calendar so that it will be seen every hour of every day of the year by all of your customers or prospective customers to whom

you send it. Once a business man uses the Desk Calendar he goes on using it year after year. It reminds him of engagements, things to be done; saves his time and memory, and enables him better to concentrate on important tasks.

And yet the cost is remarkably small in comparison with the benefits that it gives you and the goodwill it creates.

Without Obligation Post This Coupon Now

For Particulars and Quotations

To **SHAW PUBLISHING Co., Ltd.**,
6, Carmelite Street, London, E.C.4.

Without incurring any obligation I would like to have your quotation for System Desk Calendars for advertising purposes throughout 1942.

Name
Address
C.B.Spt.

I. T. R. Co. Ltd.		FORM NO. 15, K.930	
DAILY COST CARD			
No. 21		DATE 9th Jan.	
NAME James Hunter			
JOB No.	Time	Time Record	
411	OFF	AUG 9 9 11	
	ON	AUG 9 8 00	
328	OFF	AUG 9 10 34	
	ON	AUG 9 9 15	
1098	OFF	AUG 9 12 01	
	ON	AUG 9 10 36	
756	OFF	AUG 9 3 21	
	ON	AUG 9 12 58	
438	OFF	AUG 9 3 53	
	ON	AUG 9 3 28	
521	OFF	AUG 9 5 31	
	ON	AUG 9 3 59	
	OFF		
	ON		
	OFF		
	ON		
	OFF		
	ON		

This is only one of the limitless variety of forms of cost cards suitable for use with International Job Timing Machines. Phone, call for demonstration, or write:—

INTERNATIONAL TIME RECORDING Co. Ltd.
112 Strand, W.C.2. TEMple Bar 5841

For the modern office

The all-British Imperial Quiet Model 55—the most complete modern typewriter, also the Standard Model 50 and complete range of special purpose and accounting machines.

Imperial

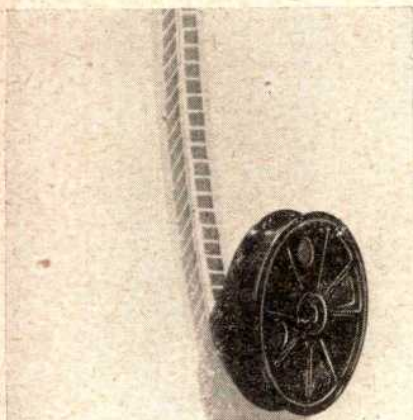


IMPERIAL TYPEWRITER CO. LTD. LEICESTER

ARP

SAFEGUARD YOUR RECORDS

*Reproduce all your valuable
records on miniature film*



THE WISE MAN takes full precautions to ensure that all the vital documents in his business are duplicated in such a way that in the event of the destruction of the originals his business can still carry on without interruption.

KODAK COPYING SERVICE

Single documents with maximum width of 10½ inches but unlimited length, can be reproduced on 16 mm. film at prices from 2 shillings per 100 facsimiles.

Bound ledgers, deeds and other documents up to 17x22 inches, can be reproduced on 35 mm. film at prices from 12 shillings per 100 facsimiles.

Ask the "Recordak" Division of Kodak Limited to quote you for your requirements at the following offices.

"RECORDAK"

(DIVISION OF KODAK LTD.)

ADELAIDE HOUSE, KING WILLIAM ST.
LONDON, E.C.4

11 PETER ST., MANCHESTER, 2

Even the smallest business can use this machine for statements, ledger posting, receipts, cash book and a variety of other work. Front and back feed, electric carriage return, if desired: date-printing key and many other features.

REMINGTON MODEL NO. 86 ALL-ELECTRIC DUAL CROSS ACCOUNTING MACHINE: latest of the Remington accounting machine range, for a variety of accounting work.

REMINGTON MODEL NO. 82 ALL-ELECTRIC FANFOLD MACHINE: used extensively for invoicing and work where a number of carbon copies is required.

REMINGTON "DALTON" ADDING AND LISTING MACHINES: for the addition of £ s. d. 12 key keyboard. Manual or electric.

REMINGTON "MONARCH" ADDING AND LISTING MACHINES: for the addition of whole numbers. 10 key keyboard. Manual or electric.

REMINGTON "PRINTING CALCULATOR": The only combined numeral adding and listing machine capable of multiplication and automatic division.

TYPEWRITERS: Remington Noiseless Standard: made in Canada. Is equipped with every known up-to-date device. Patented noiseless action.

Noiseless Portables: 88-character keyboard; all operating features of Remington Noiseless Standard.

Rand Portable: with new short-type bar action with star-wheel escapement; complete in all features.

Streamline No. 5T: made in Canada. Has every feature of the standard machine in compact, portable form.

Streamline No. 5: similar to above but with five-space paragraph key in place of complete tabulator.

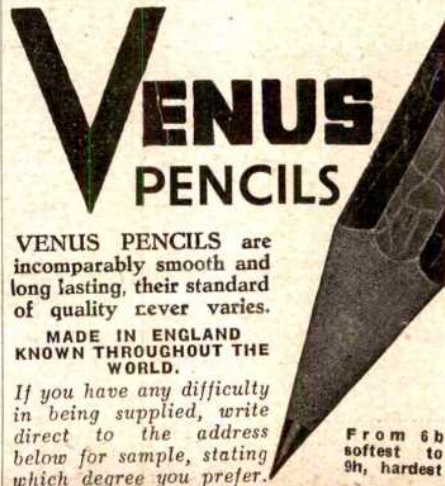
Remette: made in Canada. Standard keyboard and all essential operating features of standard model.

RUTHURSTAT, LTD., 12/13 Astor House, Aldwych, London, W.C.2.

FACSIMILE REPRODUCING APPARATUS: copies plans, documents, correspondence, printed matter, etc., by photographic process, but without need for dark-room or skilled operators.

MAMMOTH MODEL: takes originals up to 42 by 32 in. Has vacuum-pressure frame, automatic timing, retractable filter, etc.

INTERMEDIATE MODEL: copying capacity 20 by 26 in., which is as big as anything required in the ordinary office.



VENUS PENCILS are incomparably smooth and long lasting, their standard of quality never varies.

MADE IN ENGLAND
KNOWN THROUGHOUT THE WORLD.

If you have any difficulty in being supplied, write direct to the address below for sample, stating which degree you prefer.

From 6b
softest to
9h, hardest

VENUS PENCIL Co. Ltd., LONDON, E.5.

PITMAN'S for BOOKS on MANAGEMENT

Here are books to increase efficiency, speed, production, to assist organisation along modern lines, books for the war effort and for reconstruction in peace.

ORGANISATION AND ADMINISTRATION OF INDUSTRY.

By F. T. Lloyd-Dodd, M.A., D.Sc., and B. J. Lynch, Ph.D., B.Sc. An up-to-date survey of the organisation and administration of British industry. It is in three parts, tracing historical developments, discussing general principles of modern industry, and finally dealing in detail with location, planning and lay-out, etc. Bibliography and Index. 501 pages, 8s. 6d. net.

TIME-KEEPING AND WAGES OFFICE WORK

By D. J. Garden, M.A., B.Com. This book embodies the results of considerable research into the methods of accounting for time and pay-roll work generally. There are specimen forms, and various methods are fully discussed. 105 pages. 5s. net.

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By W. J. Hiscox and John R. Price. This book is now in its fifth edition and is widely used by practical factory men. It is of special importance to the administrative staff and demands their closest attention. 300 pages. 8s. 6d. net.

OFFICE ORGANISATION AND MANAGEMENT

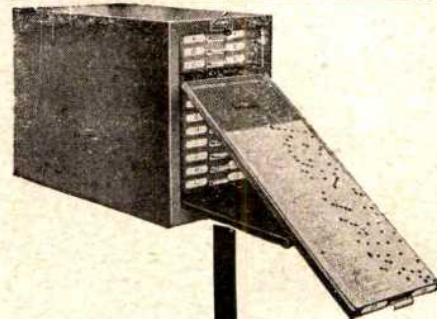
By the late Lawrence R. Dicksee and Sir H. E. Blain. Thirteenth edition by Stanley W. Rowland, LL.B., F.C.A. The best-known of all office organisation books. Discusses every question relating to office routine and all its information is reliable and practical. 326 pages. 8s. 6d. net.

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3 Useful leaflets of Pitman books—"On the Spot" (Industrial Administration); "Income Tax Headache" (Income Tax); Books on Industrial Management" by J. J. Gillespie.

PITMAN BOOKS mean EFFICIENCY

PITMAN HOUSE, PARKER STREET, W.C.2.



SELDEX

MADE IN ENGLAND.

"Seldex" Visible Record Systems and Equipment never were created and installed on such a vast scale as today, to meet the vital need of efficient managerial and production control in all its aspects.

SELDEX LTD., DULVERTON ROAD
WITTON BIRMINGHAM 6

OFFICE MODEL, double foolscap
MIDGET MODEL, foolscap.
None of these models requires skilled
workers for its successful operation.
See announcement on page 46.

SELDEX LTD., Seldex Works, Dulver-
ton Road, Witton, Birmingham, 6.

**"SELDEX" HINGE CARD EQUIP-
MENT**: Incorporating the original patent
steel clip hinge suspended on a spring
steel bar. This ingenious method of
hinging allows for one or more cards
being suspended from a single bar. The
hinge itself is a permanent part of the
equipment and does not call for replace-
ment.

"SELDEX" POCKET EQUIPMENT:
This alternative to the hinged card type,
provides for record cards or sheets being
contained in a manilla pocket with a cellu-
loid protector fixed to the visible edge.

"Seldex" hinged card and pocket equip-
ments are available in both cabinet and
non-cabinet type, to accommodate records
of varying sizes to meet individual needs.

CABINET EQUIPMENTS: range
from single tray unit containers to multi-
ple tray cabinets, embracing the capaci-
ties of 6, 12 and 18 Trays, etc., in single
and double row forms.

**"SELDEX" NON-CABINET EQUIP-
MENT**: consists of panels of the wall
or desk stand pattern.

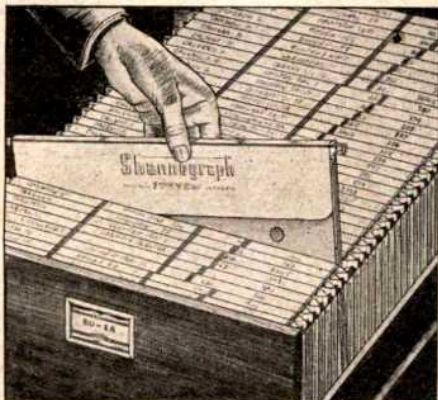
**"SELDEX" POSITIVE ALIGN-
MENT**: Cast metal distance pieces are
moulded on the ends of the spring steel
hinge bars. Thus, when positioned in the
channels of the tray, the distance pieces
butt one another, giving positive align-
ment to the exclusion of any variation in
the visible edge.

**"SELDEX" STRIP RECORDING
EQUIPMENT**: The range includes single
sided wall panels and double sided, single
or duplex swinging panels. The double
sided swinging panels may be accommod-
ated in steel desk stands, wall brackets or
rotary stands.

See announcement on page 44.

THE SHANNON LTD., Shannon Cor-
ner, New Malden, Surrey.

THE SHANNOGRAPH: New filing
system for letters and documents which
makes neatness obligatory and automati-
cally puts a check on misfiling. Every
folder is suspended on two rust-proofed
steel hangers so fixed that when the folder



is in the drawer a narrow strip is exposed
and kept perfectly flat.

This strip takes a label the width of
the folder. The label, which is protected
by a transparent sheath, takes the typed
name and address of the correspondent or

the name of the subject; thus exception-
ally good visibility is provided.

Permanent signals in colour can be
made on the label to denote department
or subject, territory, credit, etc. A chart-
ing code provides a series of colour marks
which move progressively to the right in
accordance with correct filing order of
folders. If a folder is out of place the
graph is out of step. No insert folders
are required, thereby saving expense and
increasing filing space of the drawer.

THE SHANNOBLOC: An alternative
method of applying the suspended filing
principle cuts out waste of filing time and
ensures rapid identification even in the
largest systems.

Special index tabs, which do not soil
and are always easy to read, are set at
an angle to catch the eye and can be
positioned for easy location. Folders never
become out of date, for labels are

instantly removable for re-indexing, and
special folders are "spot-lighted" by
additional colour signals.

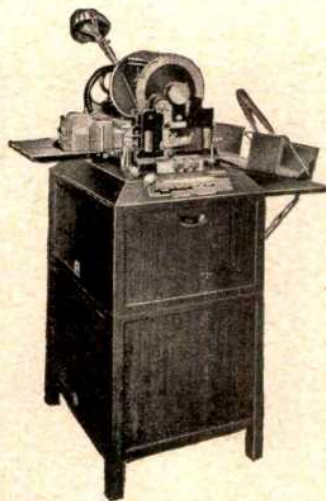
**SHANNON VISIBLE RECORD
SYSTEMS** offer finger-tip and at-a-glance
control of all the facts relating to every
phase of business. Shannon visible re-
cords are available in steel tray cabinets,
on frames, in a desk stand, revolving
stand or wall bracket, or in portable
books and panels.

OFFICE FURNITURE: Increasing
demand for office furniture at economical
prices led Shannon to introduce a new
range of desks and tables. The "Contract"
suite offers quality furniture at new low
prices.

The Shannon Limited has a complete
range of office equipment and filing
supplies and offers an advisory office
planning and equipment service.

See announcement on page 35.

DUPLICATING PERFECTION



No process or appliance has yet been
devised or invented to produce more
perfect Duplicating than Ellams range of
Duplicating appliances.

For nearly 50 years the resources of
money and scientific personnel of the
entire Company have been devoted to
the development of Duplicating equip-
ment, with the result that to-day nothing
more efficient is obtainable. Ellams
group of Duplicating Machines range at
varying prices from the small Bantam
Flat Bed Model at 35/- plus Purchase Tax
to the Automatic Electric Self-feeding
Rotary priced at £85 plus Purchase Tax.

ELLAMS CARBON PAPERS

Ellams Carbon Papers achieved popu-
larity some forty years ago because they
were the first Carbon Papers in the
World to be clean to handle and
smudgeless in operation.

To-day these things are taken for
granted and the outstanding attribute
which causes so many users to insist on
Ellams Carbons is Economy—NOT
cheapness in first cost but Long Life;
you can use them time and time again.
They will still be giving good service
when two or even three lots of Carbons
of lesser quality (although not greatly
less in price) have had their day.

Write for full information.

Ellams

DUPLICATOR CO. LTD.

ASTOR HOUSE, ALDWYCH,
LONDON, W.C.2

Phone: Holb. 5365.

MAKERS OF BRITISH DUPLICATING EQUIPMENT FOR 50 YEARS

For Photo Copying of Documents

10 hours typing reduced to 30 minutes
6 months tracing reduced to 2 weeks

Office Use—

- Avoids typing and checking
- Photo records of Government returns
- Copying statistics
- Contracts, agreements, etc.

Engineering Use—

- Eliminates tracing
- Copies blue prints
- " opaque originals, card or double-sided
- Intensifies pencil drawings

SPEED up your plan reproduction
SAVE laborious typing & checking
by installing a "RUTHURSTAT"

Copying Sizes—

Midget - - - 13" x 9"

Office - - - 16" x 13"

Double Imperial 30" x 22"

Mammoth - - 42" x 32"
or over

The Double Imperial and Mammoth Engineering models are vacuum pressure types ensuring perfect contact over large areas.

* Complete Equipments

* " "

* " "

The Ruthurstat Electro-Copyist

No dark room

No focus

No skill



British Patent

SOLE MANUFACTURERS :

RUTHURSTAT LIMITED

12-13 Astor House, Aldwych
LONDON, W.C. 2

Holborn 4737

BLINDS

J. AVERY & CO., 81, Great Portland Street, W.1.
& CURTAINS

SPECIALITY :—

A PATENT BLACK OUT BLIND FOR FACTORIES.

No light leakage at top, bottom or sides

PROPER VENTILATION.

A PERFECT BLACK OUT—
UNAFFECTED BY DRAUGHTS.

We regret that owing to demands on this blind, only work of National Importance can be undertaken.

Telephone: Langham 2433.

SUPPLIES OF STEEL EQUIPMENT!

WHERE ?

FROM—

J. W. TIMMS,

GUARDIAN SAFE WORKS,

WOMBOURNE

WOLVERHAMPTON.

CUPBOARDS, LOCKERS, BINS, WORKSTANDS.

Etc.

PRIORITY ORDERS ONLY

Telephone: WOMBOURNE 2277.

W. H. SMITH & SON LTD., Business Forms Dept., Bridge House, London, S.E.1.
"ALACRA" CONTINUOUS STATIONERY: forms for use on all makes of typewriters, accounting, tabulating and other machines. These forms are interleaved with "Alacra" one-time carbon sheets. Up to fifteen carbon copies can be obtained from one typing. The forms are marginally punched, the punching engaging in the "Alacra Pinwheel," which ensures dead accurate registration of the work throughout. As the forms move around the platen, the pins recede automatically to release the form. Thus it is impossible for the original sheet or carbon copies to creep "weave" or buckle. Time wasted by inserting carbon sheets and stoppages caused by the alignment of the work having to be corrected are entirely avoided.

SMITH PREMIER TYPEWRITER CO. LTD., Commonwealth House, 1 New Oxford Street, London, W.C.1.

NEW MODEL NOISELESS: 23 mechanical improvements including: pressure-printing device on all type keys to eliminate noise; only one-third effort needed to operate compared with standard machines. 88-character keyboard; special pressure control for varying position of carriage to suit thicknesses of work; interchangeable card platen; four-way type guide maintains alignment; variable line-spacing, etc. Carriages to take paper from 11½ to 27 in.; type and signs to customers' requirements. Attachments supplied to handle continuous stationery, record cards, carbon ribbons for hectograph work, etc.

STANDARD NOS. 50 AND 60: "Segment shift" typewriters; clear visibility; light, quick basket-shift for capitals. Carriages for paper from 10½ to 42½ in.; rubber feed-rolls keep paper rigid when typing. Model 50 has 84 characters; Model 60, 92; all modern type styles and languages. Both models fitted single-bar tabulator; also supplied with 10-key, inbuilt decimal tabulator.

NOISELESS (PORTABLE) 51: same noiseless type-bar action as Standard Noiseless 88-character keyboard; all operating features of Standard machine (except tabulator); one carriage width, taking paper 9½ in. wide; various style types and keyboards for most modern languages. Travelling-case; weight, with cover, 16 lb. 6 oz.

SMITH PREMIER (PORTABLE) NO. 11: has every operating feature of standard typewriter, including 5-stop tabulator 88 characters; weight 17 lb. 1 oz.

PORTABLE 5 T. and 5 Par.: similar to

STAGGERED PAY DAYS

Over 60,000 concerns are using Brandt Wages equipment, and this enables them to maintain a very high degree in efficiency, particularly in these days when many staffs are depleted due to National Service and other causes.

WE CAN BE OF ASSISTANCE IN YOUR WAGES OFFICE

You can write for a copy of the booklet which tells how the BRANDT reduces the cost of PAYING WAGES—or—Why not ask our Representative to call? A demonstration involves no obligation.

BRANDT AUTOMATIC CASHIER CO. LTD.

41 FURNIVAL STREET, LONDON, E.C. 4

Victor T and S, but designed to fit in smaller case and fixed to baseboard. Difference between T and Par models, former has 5-stop adjustable tabulator for statistical work, latter an automatic 5-stop paragraph key (operates without setting of stops); weight 5 Par, 13 lb.; 5 T., 13 lb. 2 oz.

S.P. JUNIOR PORTABLE: full standard keyboard; English only; weight 11 lb. 7 oz.

THE STANDARD OFFICE SUPPLIES CO., 57 Farringdon Road, London, E.C.1.

'WAXCRAFT' CARBON PAPER: something notable in carbon papers. Basic factor is that the back of this carbon paper has been coated with a special preparation which gives it a glossy waxed surface. Five advantages, it is claimed, result from this new treatment—

1. It doubles the strength of the carbon paper. Waxcraft carbons do not "tree" or crease like ordinary carbon papers.

2. It gives extra "body" to the paper and so counteracts the tendency to curl.

3. It enables a much heavier coating to be placed on the front of the sheet. This means that each carbon lasts longer and gives a sharper impression to the very end.

4. Waxcraft carbon paper has a non-smudging surface. It will not rub off on to your fingers, nor will the carbon copy itself smudge.

5. The special coating on the back of the carbon prevents them from clinging to the duplicating paper. Handling a Waxcraft carbon is like dealing with a new pack of cards as compared with an old and sticky pack. When taking many copies it halves the time spent in removing and replacing the carbons in the sheets.

See announcement on page 2.

THE TAN-SAD CHAIR CO. (1931) LTD., Avery House, Clerkenwell Green, London, E.C.1.

TAN-SAD SCIENTIFIC SEATING: science of comfortable seating has been studied by makers of Tan-Sad seating. Wide range of chairs and stools, each designed to suit the work of the user, to enable him to work with the highest degree of comfort and a minimum of fatigue. All models incorporate the Tan-Sad system, in that being anatomically correct in design and construction, they enable perfect posture to be maintained.



ACCOUNT BOOKS ARE DESTROYED BY FIRE OR ENEMY ACTION

PERCY JONES (Twinlock) LTD.

Accounts Advisory Dept.

37-38 CHANCERY LANE, LONDON, W.C.2

Phone: Chancery 8971

MANUFACTURERS OF LOOSE LEAF BOOKS & MACHINE ACCOUNTING EQUIPMENT

SHORTAGE of LABOUR

In many cases
LIGHT-RAY APPARATUS
has overcome the trouble

Send your inquiries to:

RADIOVISOR PARENT LTD.

1 STANHOPE ST.

LONDON . N.W. 1

Telephone: Eus. 5905

50% FASTER SORTING The Ambidex System

Cuts out waste effort.
Simplifies and organises sorting.
Meets individual requirements.
Speeds up Filing, Ledger Posting, Recording, Invoicing.
Provides instant reference to papers.
Saves Postage.
Saves Stationery.
Accelerates the flow of work throughout the Office.

Write for particulars:

AMBIDEX
Equipment Company

Emergency Address:

13 Keynsham Avenue, Woodford Green, Essex

Telephone: Buckhurst 3317

IMMEDIATE TELEPHONE CONTACT

LOUDSPEAKING—NO SWITCHBOARD—NO DIAL

With Dictograph Telephones installed the Chief Executive can communicate with any department *direct*—by a simple flick of a key. All departments can also communicate with one another, but executive calls get priority *automatically*. A representative will gladly call to discuss possibilities. Information, demonstration, survey, estimates or rental terms—free on request. Twenty-five years' experience at your disposal.

Executive's Instrument

* Under present conditions, we can only cater for those firms engaged on Government work.

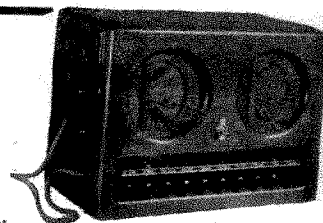
DICTOGRAPH TELEPHONES LIMITED

Abbey House, Westminster

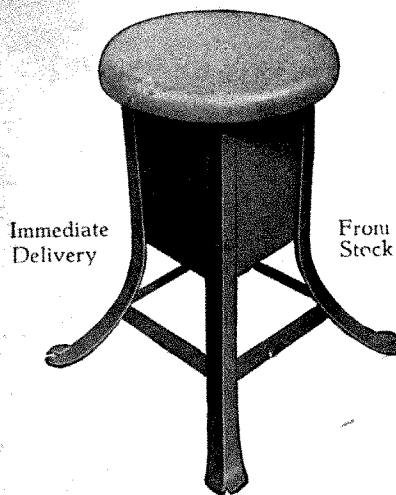
ABBEY 5572 (3 lines)

Branches at GLASGOW, BIRMINGHAM, MANCHESTER, LEEDS, NEWCASTLE, BRISTOL, CARDIFF AND DUBLIN.

A.R.P. Consult Dictograph on Telephone and Sound systems for A.R.P. and Music in Factories.



FACTORY and WORKS SEATING



THE "KEMCLO" STOOL

as illustrated 13/- delivered;
17/6 with Back Rest.

Model 2—Extra large compartment and
special seat 25/-.

*ALL METAL CONSTRUCTION
*LOCKER COMPARTMENT UNDER
SEAT (hinged to form cover).

*CAN BE CONSTRUCTED & MADE
TO CUSTOMERS' OWN HEIGHTS &
SUGGESTIONS.

'KEMCLO' HARDWARE Co.
55 Netherwood St., London, N.W.6.
MALDA VALE 1331.

PAINT LABELS for MACHINERY

By
TRAPINEX

If you have any difficulty in securing adequate and prompt supplies of metal or other name or instruction labels or find difficulty with paper labels on metal, etc., why not follow the example of leading manufacturers who are using "TRAPINEX" Paint Transfers with conspicuous success.

Delivery is speedy, of any size or colours, and the details being printed on durable paint lasting service is assured.

FOR WINDOW ADVERTISING. "TRAPINEX" Paint Transfers in larger sizes provide the most effective means of maintaining brand goodwill in these days of restricted advertising and supplies. Anyone can apply, once in position they last indefinitely and cannot get soiled or lost like showcards and window bills. Ideal for export.

WRITE OR PHONE FOR DETAILS—

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8 Commerce Works,
43 Commerce Rd., London, N.22

BOWES PARK 2689

TELEPHONE RENTALS, LTD.
Horseferry House, Westminster London,
S.W.1.

"TELEMATIC" AND "CHRONOMATIC" SERVICES. "Telematic" is a complete inter-departmental telephone service providing from 2 up to 800 lines of communication, installed on a rental or sale basis, inclusive of regular inspection and mechanical upkeep. The main types of apparatus are referred to by code numbers.

TELEMATIC 50/500 consists of instruments with dial switches operating through a private automatic exchange serving any number of points from 16 to 800 with absolute secrecy.

Selected instruments may be equipped with a "priority" feature enabling executives to interrupt conversations of subordinates instead of waiting for them to become disengaged. Private secretaries can weed out unimportant calls to their chiefs. Conferences can be held between executives.

Loud-speakers, staff-locators, and fire-alarms can also be incorporated.

Press buttons may be associated with a telephone to obviate using the dial when calling certain points most frequently spoken to. By "tie lines" between switchboards, widely separated premises may be included in a single automatic system.

J. W. TIMMS, Guardian Safe Works,
Wombourne, nr. Wolverhampton.

SAFE CABINETS: "Guardian" model, tested in 1,310°F. furnace for over one hour, resulted in the temperature inside the cabinet rising only to 218°F.—that is 82° below the point at which paper be-

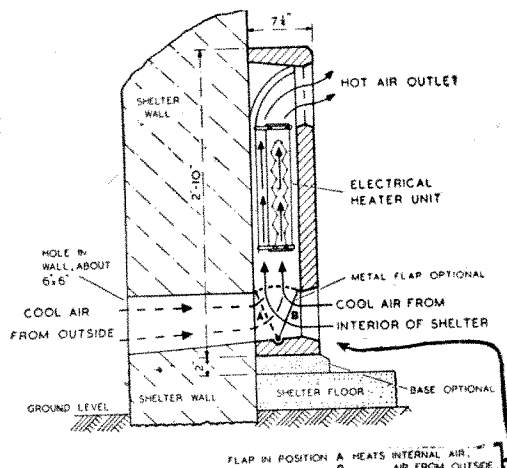
ELECTRIC HEATERS for PUBLIC and INDUSTRIAL SHELTERS

Heavy Precast Concrete Casing with
fixing lugs for bolting to wall. Sup-
plied with or without Electric Element.

Standard Electric Element of 1½ Kilo-
watts sufficient to heat shelter of 1500
cubic feet capacity. 1 kilowatt element
supplied if desired.

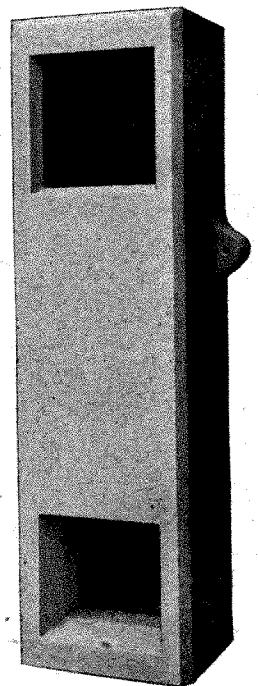
Heating installations for shelters should be decided on now. Do not wait until the
winter months before ordering such equipment—we can give immediate delivery.

The STENT Shelter Heater is economical, efficient and simple.



SHOWING THE
SPECIAL
AIR-FLOW
SYSTEM

CAST
CONCRETE
CASE



Send to-day for full details:

STENT PRECAST CONCRETE LTD.
2 CENTRAL BUILDINGS,
WESTMINSTER - S.W.1

Tel.: Whitehall 2573

gins to char. A feature of these cabinets for safe storage of ledgers and other records is their unusually low price.

See announcement on page 46.

UNDERWOOD ELLIOTT FISHER, LTD., .55 Greek Street, Soho Square, London, W.1.

NEW CLASS "D" AUTOMATIC ACCOUNTING MACHINE: this is an outstanding addition to the wide range of Underwood Sundstrand machines.

This new Class "D" range, is equipped with two separate and distinct cross-footers which may be controlled automatically or manually. All amounts are written on one keyboard regardless of which crossfooter and/or register is being affected. No time is lost in selecting the keyboard, no error can occur through writing the amount on the wrong keyboard. Touch operation on a single keyboard results in greater speed and accuracy.

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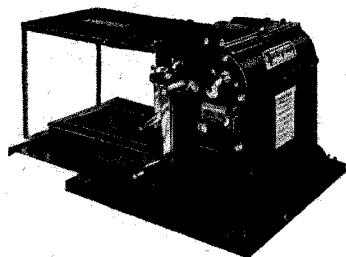
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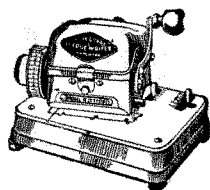
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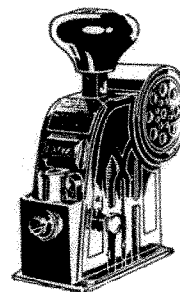


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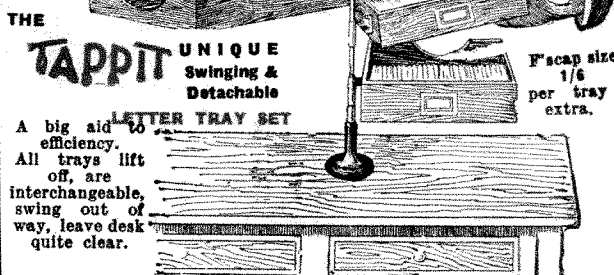
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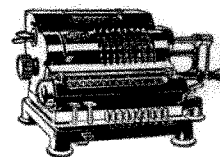
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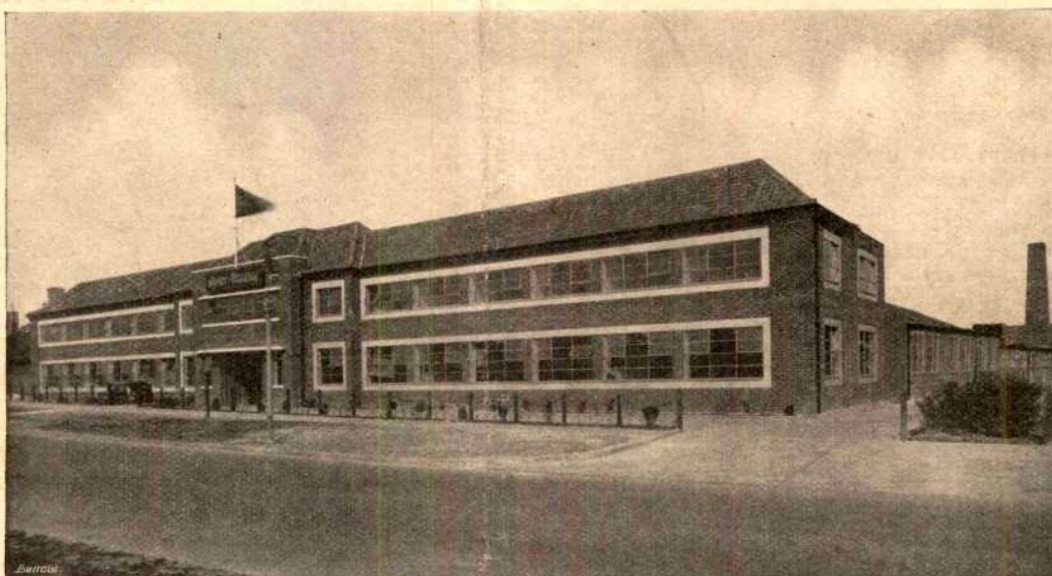
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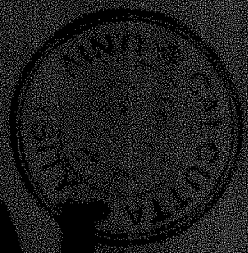
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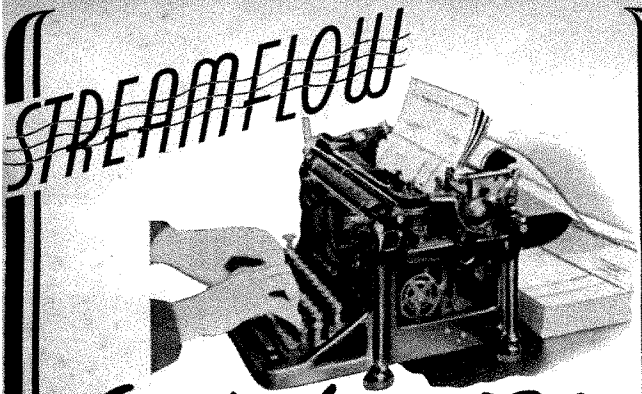
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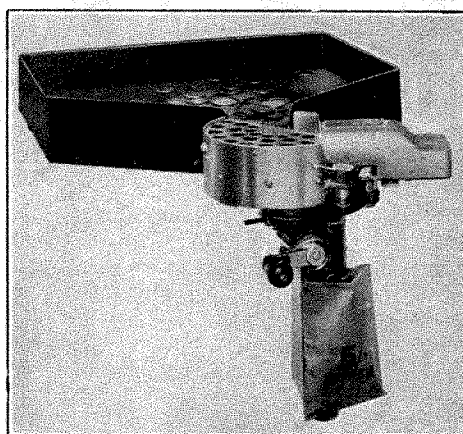
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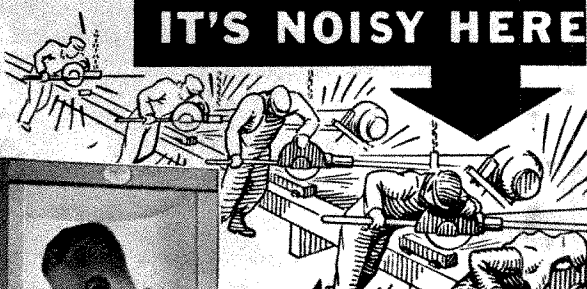
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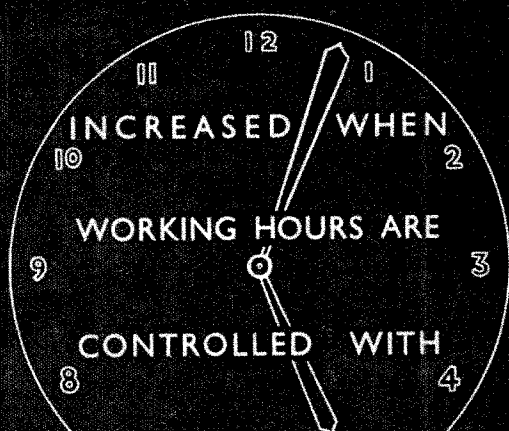
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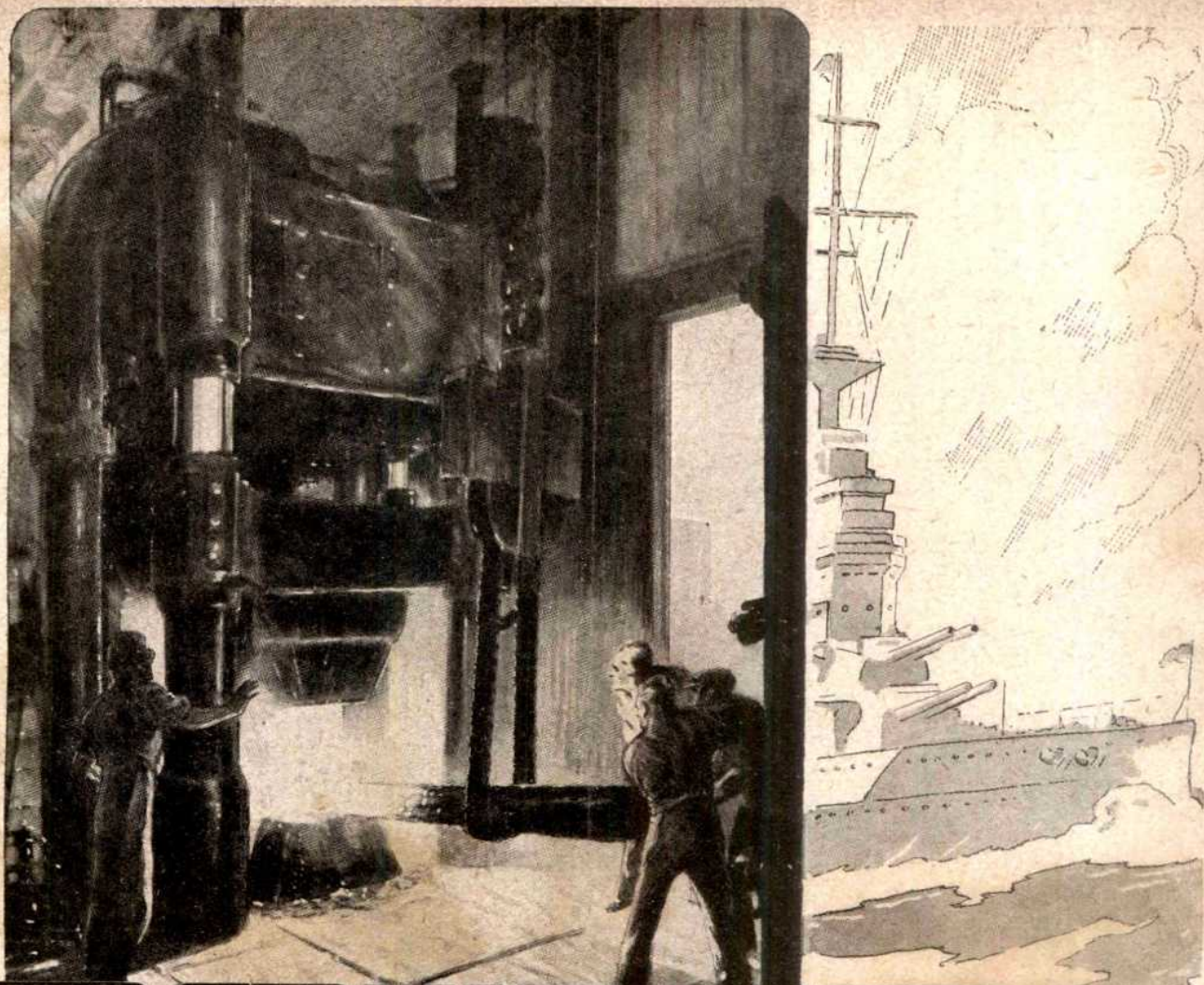
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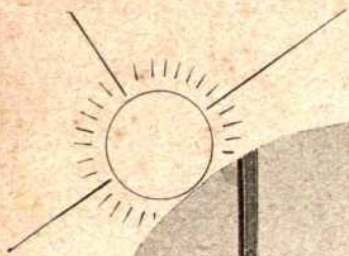
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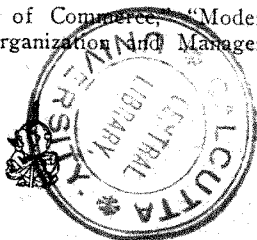
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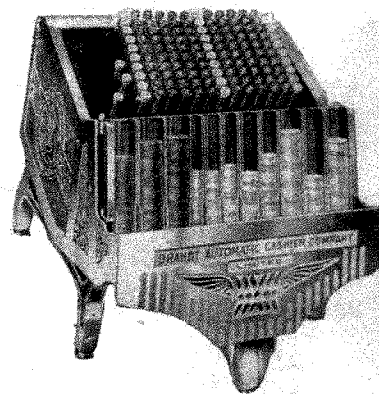
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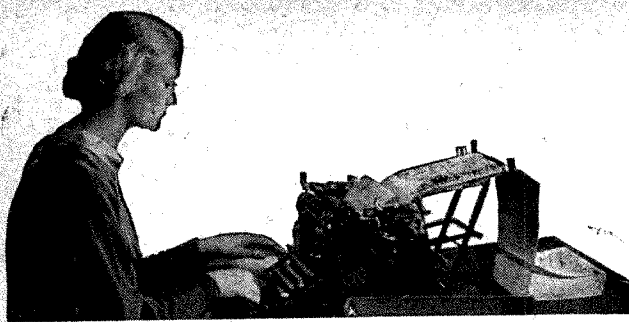
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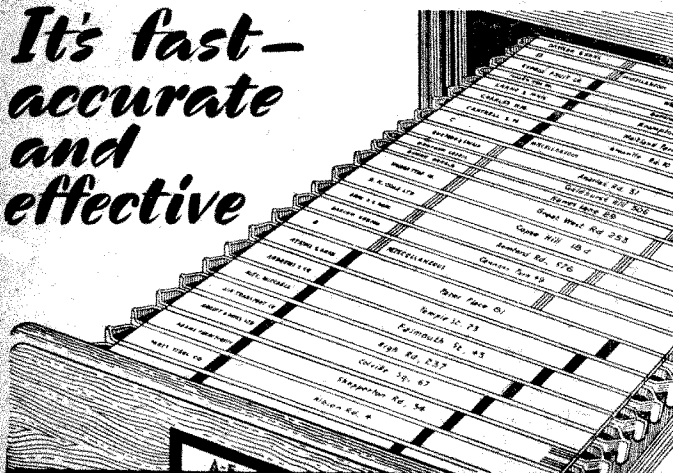
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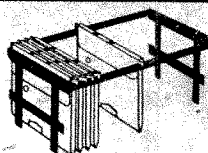


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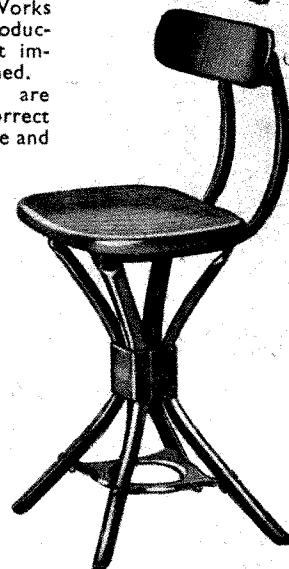
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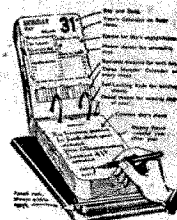
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FACTORY DISPERSAL

Gives More Democratic Management

THE war has brought about many revolutionary changes in industry. But none have been so great as the policy of dispersal of factories, introduced primarily as a precaution against production upheaval owing to air raid damage.

Dispersal has many sound points against it. It inevitably involves more paper work and a great extension in transport. But the successful operation of de-centralised factories since the outbreak of war has brought to light a number of advantages which could not be foreseen when the policy was introduced, and which, in fact, outweigh the arguments against dispersal.

Spurred on by the Ministry of Aircraft Production, Britain's aircraft manufacturers have developed this policy more extensively than any other type of industry. While requirements of public safety prevent us from disclosing full facts and figures, *BUSINESS* has been granted special facilities by the Ministry of Aircraft Production for ascertaining the inner working and merits of this de-centralisation policy.

New Factories Could Not be Built at Aerodromes

Ministry officials selected for *BUSINESS* what they considered to be one of the finest examples of dispersal in the country. What this aircraft company has been able to achieve, and the methods they have adopted, can be copied in many ways by other industries who seek to find means of guaranteeing the continuity of production through the severest blitz.

When the aircraft industry began to expand three or four years before the outbreak of war the whole production of this particular firm was concentrated at two aerodromes. At one of these the air-frames, wings, etc. were produced. At the other aerodrome engines were made. This elementary example of dispersal had been the result of the steady growth of the firm since 1919 and had worked out very satisfactorily for many years. The limitation on expansion in one place by the size of one aerodrome had led to the acquisition of the second 'drome, with its accompanying factory space.

Dispersal Means that Job is Taken to the Worker

With the big step-up in aircraft production which came with the building of a greater R.A.F., the factories of this company were extended to their limits. But even then they were not

Faced with production upheavals as the results of enemy air raids, the Ministry of Aircraft Production introduced a wide policy of factory dispersal. Here a BUSINESS Investigator gives an outline of the advantages which this policy has provided, many of them unforeseen when it was started

big enough. So, additional premises had to be sought. One of the great handicaps of expansion had proved to be the lack of labour in the area around the main factory.

With the acquisition of new premises it was decided to take the job to the workers, rather than complicate still further the labour problem by extending the factory near the main aerodrome. Accordingly, the new factories were taken close to neighbouring big towns, where it was considered that an adequate source of labour could be tapped to cope with any future develop-

ments. Some of these towns were five or six miles from the parent factory, while others were as much as fifteen miles away.

Immediately the firm began to expand beyond its original limits the transport problem became a very serious matter. But by adopting the policy of dividing the whole factory into its individual shops and permitting these to expand as they were required, throwing out tentacles which kept the expanded shop more or less as a unit, although actually it might consist of several individual factories, much of the transport difficulties were lifted.

How Excessive Transport is Overcome

Thus, where one shop has to divide itself into perhaps seven or eight sections they all remain closely tied together and under the supervision of the same executive as when the shop was a single unit. Similarly, all the raw material requirements are grouped in a central store, incidentally situated away from the main factory but in a convenient place for all the individual factories to draw on without causing extensive transport arrangements. By the careful planning by the executive responsible for production in each group of factories making up a single shop, the flow of raw material into the factories can be adjusted to meet the immediate requirements of each unit. And the same lorries used for the haulage of raw material can, when emptied, be used to take the finished products of the factory to the central assembly shops or to any factory as the production programme demands. In this way, transport is reduced to a minimum and very rarely does a lorry have to make an "empty" journey.

By permitting control of production in one shop group to be in the hands of a single executive, there is little need for the central executive board to be

Six Advantages of Factory Dispersal

- 1 **Production can continue uninterrupted in spite of "blitzes."**
- 2 **New Factories can be established near to large sources of labour.**
- 3 **Workers on long shifts do not have tiring journeys to and from work.**
- 4 **Absenteeism is reduced by Number 3.**
- 5 **Workers in small factories have greater "team spirit" than those in large works.**
- 6 **By grouping sub-factories on same production, one executive can control whole production unit.**

consulted except on matters of broad policy. Each shop group becomes as it were a separate producing unit, almost equivalent to a sub-contractor supplying certain goods or parts but not having extensive supervision by the directors of the principal company.

Dispersed Factories Should be Within 4 to 5 Miles Radius

This does not mean, of course, that there is any slackness in executive control. But the policy gives a broad democratic structure to the company, rather than the autocratic one that is liable to be built up when a firm rapidly expands far beyond its original bounds, and has been proved to keep production at the peak demanded of the British aircraft industry at the present time.

Over the past two years it has been found that production flows most easily when the dispersed factory is situated within a radius of about five miles of the parent factory. This enables the transport department to make comparative even runs between the various factories, which was quite impossible when some factories were fifteen miles or more from the centre while others were only three or four miles from it.

Happier Labour Conditions Are Another Important Advantage

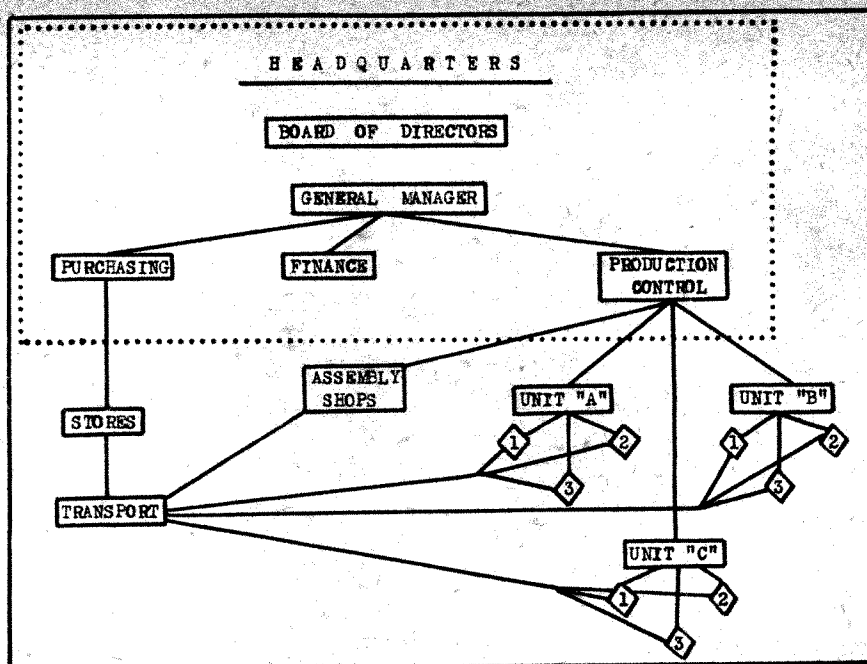
Another strong point in favour of this somewhat narrow grouping is that it permits the easy transfer of labour from one factory to another without imposing arduous cross-country journeys of many miles, if there is a sudden call for extra help at any particular factory.

Happy labour conditions are a very important consideration in the eyes of this company. As a result of their policy of taking the job to the worker rather than making the worker undertake lengthy country journeys to and fro on top of long hours in the factory, they have managed to bring their figures for preventable absenteeism down to a rate which should be the envy of most firms in the country.

Democratic Supervision Simplifies Control

Small factories, they have found, tend to foster the growth of the team spirit much more easily than would be possible with a large unwieldy labour force in a vast factory. In their efforts to maintain this "team spirit" they have sought wherever possible to keep together workers who were employed by various firms, now regarded as "non-essential," who have closed for the duration of the war.

Directorial control of any rapidly expanding firm at the present time is not easy, but by permitting the democratic supervision on the scale described above, the management of the company is able to confine its work to important policy control and depute all simple production worries to executives in actual contact with the various shops.



This chart gives in outline the main links in this dispersal scheme. To simplify it, only three units are given, each with three sub-factories. In actual fact, the number of groups greatly exceeds three, while each group may contain up to a dozen sub-factories. Only the departments inside the dotted lines are located at the headquarters of the company

This permits the management to retain a broad clear vision of the firm's activities, unhampered by day-by-day routine matters.

In future issues of BUSINESS it is hoped that we shall be permitted to publish more detailed articles showing the simplified office control scheme which has been adopted to minimise the vast volume of paper work which became necessary in the early days of dispersal, but which has now been reduced to more reasonable limits. The

experience of this particular firm shows that except for the work involved in checking transport deliveries and collections, there is little need for more intricate paper work than when all shops are located under one roof. Provided a "team spirit" is maintained, both among the lower grade employees and supervisory executives alike, it has been proved that dispersal can bring many advantages to industry which go far to solve the problems of war-time production.

Overdue Accounts cut from 20% to .5%

AT the outbreak of war, a well-known food manufacturing company was allowing all its customers a 28-days period of credit. Since collections of discounts was left to the company's sales representatives, who made monthly calls on all these customers, it often meant that a retailer would not be asked for payment until at least 35 days had elapsed after delivery of the goods.

At this time, the company had approximately 16,000 open accounts on its books. But, the average number of customers who failed to make their payments at the end of the normal period of credit represented approximately 20 per cent. of the total number of accounts. With the new conditions resulting from the war it was decided to introduce some system which would cut this 20 per cent. to a more reasonable figure.

The idea that was eventually adopted was extremely simple. For years it had been the custom of the company to leave the collection of accounts to its salesmen. Accordingly, it was decided to offer a bonus award of one guinea per month to every salesman who was able to show a clear record of no overdue accounts on all his round of calls for the month.

So effective has this small cash incentive proved in action that the figures for September this year have dropped to .5 per cent of the total number of open accounts, which, incidentally, have now risen to over 17,000. And this in spite of the fact that quite a considerable number of the company's customers have suffered complete or partial loss of their shops and stock-in-trade through enemy action!

Business Mustn't Kid Itself



Max Rittenberg, expert marketing man, tells us what he thinks will happen to industry after the war. Government control of all aspects is forecast by him

IN using this title I had in mind the numbers of business men who are still wishfully thinking that after the war, we are going back to much the same old competitive business, much the same "no limit to profits," much the same free-for-all in publicity and selling methods.

At the present moment we ordinary people are like straws in the hurricane, like chips in the torrent. But the business men I am thinking of seem to believe that after the war the torrent will reverse, will turn up-river, will land them back into the quiet waters and familiar pools they enjoyed pre-war.

Is Nationalisation of Industries Coming?

On the contrary, I affirm that we shall be carried down to a new country where the geography is vastly different from the upland meadows we used to know.

I believe we must look to a new era after this world-war—an era totally different from anything we have hitherto known in commerce. We shall be a nation victorious, but totally stripped of our former possessions and credits in American dollars and American shares; denuded of funds in the South American countries and others of the neutral nations.

We shall no longer be in our former lucrative position of the world's banker and money-lender. We shall have to reconcile ourselves, for many years to come, with a standard of living and luxury far below what we thought was normal in 1938 and during the first half of 1939.

I believe that this post-war era will be a time of far greater Government control of industry. I see a nationalisation of industries beyond the limits which we had become accustomed to. For transport and the distribution of goods and other services, I see a far greater control than we have now. I see a far greater control over the production of goods and other services than we have now.

materials, such as steel and aluminium and timber and leather, which are accepted to-day as war-time necessities, will have to persist after the war in some directions while we are building up our national capital afresh—and also to ensure a fairer distribution to all classes than we knew before the war.

Now, what will it mean for advertising and for business in general?

It will mean, first and foremost, a big reduction of those competitive advertising and selling methods, inside the British Isles, which we took for granted before the war.

Those of you who are manufacturers know, even more closely than I do, how the trade buyers and the public have queued up to take anything reasonable that you have to sell. So long as any form of Government control and rationing persists, that must and will continue.

Before the war there was a great cry-out all over the world about "Over Production" of manufactured goods. Take razor blades as an instance. So many razor blades were produced that advertising men had to be called in to invent new selling angles for them.

But to-day, as you very well know, "Over Production" of razor blades in this country has completely disappeared. The difficulty is to buy as many as you and I need for ordinary shaving purposes.

Common-sense of Rationing Raw Materials Has Been Proved

So, isn't it clear that the real economic answer to "Over Production" of manufactured goods is to ration raw materials to manufacturers? So many razor blades will be needed approx. for so many inhabitants of these islands. That means so many tons of steel. Why let the manufacturers have too much steel and make too many razor blades for home consumption?

I see the Government of the post-war era telling manufacturers and traders of all kinds: "We want you to sell for export, rather than for home consumption—so that national capital can be built up afresh. Therefore, concentrate your advertising and your selling on the markets of the world instead of the markets of Britain. Our Government control will encourage the one and discourage the other."

In the second place, consider the large numbers of new factories erected for Government war purposes—and all the millions of men and women now working in them. Are all these factories to be left derelict at the end of the war? Are all these munition

workers to be sacked? And the demobilised soldiers too? Are we to repeat the tragedy of 1919 and the years thereafter, when millions of men were thrown loose on to the labour market to fight amongst themselves for jobs and homes?

No! Surely it will be imperative for the Government of that future day to continue to keep those works going—to use some of them for the reconstruction and repair work of this country and to turn over others to the production of goods useful for export trade.

Plans for Control of Post-war Man-Power Already In Hand

In fact, one member of the Cabinet, Mr. Arthur Greenwood has already been entrusted with the preparation of plans for using man-power and women-power after the war.

In brief, I see the Government as an employer of labour on a scale far greater than anything we knew before the war. And this will become a factor in commerce which will change the essential conditions of industry as we knew it.

I see also a big migration from the British Isles to the vast lands of Canada, Australia and New Zealand, South Africa and Rhodesia—and also perhaps for the development of tropical lands under the British Flag.

This too would bring about profound changes in the structure of home commerce.

Let's consider also the question of business profits as they used to be. Before the war there was no limit to business profits apart from the income tax on them. Now every working partner or working director of a business is restricted, as you know, to a definite salary—and the rest goes to maintain the joint national effort in the form of E.P.T.

Return of Unlimited Individual Profits Unlikely

You know what it means. In a moderate-sized family business, the limit for the working director is £1,500, and after income tax has been deducted, the maximum wage of a highly specialised manager of a family business is about £800 a year.

Are we to assume that, after the war, E.P.T. will vanish and we shall be back again to an era of unlimited individual profits?

I think not. I feel very definitely that much of this restriction will have to be continued for long time in England-to-be in order to rebuild the national capital.

MANAGEMENT in War-time . . .



EVERY production man has seen the change of attitude in shop stewards since Russia came into the war. More particularly since the conferences of shop stewards in Greater London and in the Provinces. Shop stewards who formerly went to the management only with complaints and scowls are now bringing constructive suggestions for increasing output. Probably such co-operation from the workers has rarely been known in this country since the days of Queen Victoria.

Are managements making the most of this new opportunity? Some of them certainly are; others equally certainly are not.

Blame supply and the delay in Ministers' instructions, blame shortages in materials, blame delays and discrepancies in departmental instructions as much as you like, the cause of many a delay still lies with the management. The weak spot in many of the aircraft factories in particular is the progress work. There is a very simple reason for this. Many of the executives in the new factories are untrained in mass production methods. They were not familiarised with gaunt charts and other routine progress control equipment, let alone methods, in their youth. As a result they simply do not know how to avoid minor shortages in materials, parts and accessories, either at the bench or on assembly.

AN EFFICIENT PROGRESS SYSTEM IS THE KEY

THERE is only one solution to this problem. Some directors are shying at it. This is because it involves so much re-organisation work and under the continued cry for output we must sympathise with them. Yet no factory on anything so complicated as tanks or aircraft work will ever avoid endless

delays without a complete modern progress system, backed by the right equipment in the shops, in the stores and throughout the factory.

Last month we published one excellent and very simple progress control system. This month we show another. Every succeeding issue of *BUSINESS* will contain at least one progress plan. Any reader who feels he has got something better in practice, will be doing a service in sending us an outline of the plan. We can very quickly assess whether it is worth while for us to go into the scheme in detail. One of our editors would be glad to visit the plant and study the system in action.

WOMEN ARE DOING TIME STUDY WORK NOW

ONE of the great troubles in setting piece rates for big new jobs is the lack of skilled people to do the time and motion study work. One enterprising firm in the north has taken a bold step. It has asked a well-known time study expert to spend considerable time on its premises teaching six women to do time study work. Of the women selected, two are University graduates and four are women with practical experience of factory work.

I feel unusually confident of the success of this experiment. First, because of the patience, attention to detail and accuracy required are just what women possess. Secondly, a woman will make her studies more unobtrusively and tactfully than many men.

TEACHING YOUNG EXECUTIVES TO THINK

HARDEST task of directors to-day is securing efficient management from young, half-trained or untrained executives. He gives the wrong

decision more often than the right—simply from lack of experience. Few senior executives have the time to give the necessary training and judgment required. To-day new men must think out and submit new schemes for entirely new jobs on their own judgment. I found a useful test for the new scheme in an American book *The Art of Practical Thinking*, by Richard Well, Jr., just published here by Jarrolds. This is the basis of the test:

What is your objective—that is, what are you trying to accomplish?

What people are available to do the accomplishing—that is, what is your situation with regard to personnel?

How do these people fit into the total operation and what are their duties—that is, what is your organisation chart?

What is the description of the physical plant with which the operation is to be executed?

What are your financial resources?

THEY GET A KICK OUT OF THE BOSS'S PRESENCE

"MORE co-operation between the two sides, of Capital and Labour, a franker discussion on the real situation, and an explanation to the men that they are really working for the State and not for their employers would solve many problems." Thus says Trevor Evans, industrial correspondent of the *Daily Express* in his new book "Strange Fighters, We British" (London: Robert Hale, 3s. 6d.).

Evans tells this true story as an example: One Wednesday night last February a ship owner went down to the docks, ran up the gangway of one of his ships and went down the ladder into one of the holds where men were working under tarpaulins. The gang went on at a normal pace, although they recognised their visitor. "Dockers are sturdily independent in such circumstances," comments Evans.

"I'll tell you chaps what," called the shipowner. "I'll bet you fifty pounds to a blackbeetle you won't clear this hold by midnight on Friday."

The spokesman for the fourteen men laconically answered, "Done." The hold was cleared by seven. Twenty minutes later the shipowner paid his bet and the men were local to have.

"Now I know," he said, "the charge," he said, "the system we have."

An elder said, "I know another system might be better than this."

Where do You Find The Right War-Time Executives?

The biggest problem in business to-day is finding the right men to fill vacant executive chairs. Here are many incidents showing the methods used by leading firms to help men to assume greater responsibility



THE rapid changes in industries to meet war-time expansion and the loss of executive staff to the Forces and to firms on vital war production, has produced a tremendous demand for new executives.

The men who fill the new posts must be found very largely from within an organisation and must have had efficient training if they are to make a good showing in their new posts.

How is industry able to find such men in the large numbers needed to supply the demand? If such men exist, why did they not come to the top before? Or are many of them misfits who are able to disguise their lack of qualifications only by the speed at which war-time industry must proceed?

So important does BUSINESS consider these questions, that the Editors decided to make a close investigation of the qualifications demanded of newly appointed managers and other budding executives in a number of leading industrial concerns.

War Conditions Impose A Heavy Strain on New Executives

War-time conditions have imposed many new duties on executives. To be able to cope with these, men who have been thoroughly trained for their posts, must often rely on their own common sense and initiative rather than on the detailed training they have had. Not the least of these new worries is that provided by new staff, often untrained and completely unprepared for modern industrial life as well as lacking that team spirit which is imperative for successful conduct of any business.

Other problems arise from the vast changes which have been necessitated by war-time rearrangements of production needs. New systems must be devised to ensure regular supplies of raw materials and to permit production schedules to be maintained despite changes in hours and working conditions. All these problems impose a heavy strain on a man new to executive duties. It is therefore essential that a

man selected for the post must be the best available.

From our study of the experience of men who have reached executive positions in the past two years it appears that they may be divided into three classifications:

Where New Executives Come From

The first and largest group includes executives who began in minor positions with their present companies and gradually worked up through many different departments before the war gave them their opportunity of reaching executive rank.

The next largest classification includes men who started with their present companies when those concerns were small with little or no sharp division between duties. They have grown with their companies, doing all manner of work and acquiring broad experience as the company reached the stage where it needed executives to take charge of the various departments which had to be organised.

The third group includes men who have made a reputation with some other company and were engaged for their present jobs on that reputation.

The following examples will show the type of man who is successfully filling an important job to-day. It is difficult to write an exact prescription since the requirements of every industry are different, and even vary between firms in the same type of business.

Executives Cannot Be Mass-Produced

Every business has its own peculiarities. Some businesses are essentially production industries, where production technique and methods are the chief determining factor in a company's success. Other businesses are commonly looked upon as "selling" concerns, where the sales problem is the uppermost problem in its success. Because of this distinction, no one would dare

to lay down hard and fast rules about the ideal experience and qualifications for an executive. In one type of business, a sales expert might be the ideal man for a high executive post, while in another that same man would be utterly the wrong man for a manager's chair.

The present general manager of a highly successful machine tool company is now training his successor. This new man has been in every department of the business, at home as well as overseas. He has served the planning, production and dispatch departments as part of his training for his new post.

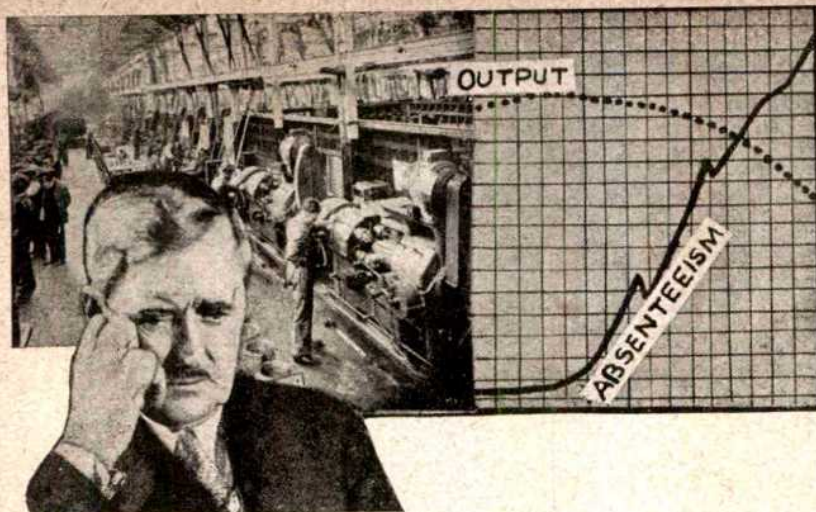
The man originally joined the staff as a clerk, when the firm consisted of less than a dozen employees. He knew a little about accountancy and controlled that side of the business in its early days. As the business expanded, he became first purchasing manager and later office manager. He supervised the building of the first factory building and later three additional buildings. He has an intimate acquaintance with every detail of operation, as well as every departmental duty and operation. He has seen the business grow and duties divided.

A Good Manager Must See Far Beyond His Own Job

There is a strong current of thinking in business that a general manager or high executive must have a background rich in experience of many phases of the business. One general manager told BUSINESS that he visualised that the job of an executive "is to see that a profit policy is put into effect and followed by the entire organisation. He must assume responsibility for co-ordinating the work of his own department with that of every other department in the firm, so that they work as a team towards the achievement of the policy of the management."

Another executive agrees with the above and amplifies it by considering that any departmental head must be a man of wide experience and have

(Please turn to page 18)



Six Ways to . . . Step-up Output, Ease Absenteeism

THE nation-wide survey of the causes and remedies of absenteeism, which was conducted by *BUSINESS* and reported on last month, revealed that many firms in different industries have been able to ease absenteeism and so step up output by offering various inducements to their workers to make regular attendance worth while.

Many of these firms recognise that unpunctuality is itself a mild form of absenteeism and that any steps which go to solve this problem are, in turn, helping to strike at the bigger problem. Often a worker, who knows he will be penalised for lateness, will take the whole day off when he realises he may arrive late at his work.

Overtime Paid Only After 47 Hours Have Been Worked

Thus, the manager of a well-known time-recorder manufacturing concern sent us the following report:—

"Our managing director has hit on a novel way of helping the nation, and at the same time encouraging our workpeople to be early at their work. Twenty of the best time-cards are selected and drawn by way of lottery, the winner being given a National Savings certificate. This little event has had the effect of inducing our workpeople to be punctual."

Another firm has struck right at the heart of the problem by revising completely the system on which overtime is paid. Instead of overtime being based on an eight-hour day, it has been revised to be paid on a 47-hour week, i.e. no overtime is paid until 47 hours has been worked, then time and a third is paid for the next 8 hours (repre-

senting one day's work and also a fair average of present overtime at this rate); after which, double time is paid for a maximum period of 18 hours.

In practice, on a 12-hour day, less one hour for meal-times, a worker under this scheme begins earning double time on Saturday morning, as he has then worked 55 hours in all—47 at ordinary rate, and 8 hours at time and a third. This is already in excess of the national average working hours at present worked—he has therefore qualified himself to earn double time for the next 18 hours, or 11 on Saturday, making a total of 66 hours in 6 days, with Saturday free.

Certain adjustments have, of course, been made to meet stoppages, illness, etc., but these have been overcome quite simply. When the 47-hour minimum is not reached because of stoppages for illness, every eighth hour can be accounted as overtime at time and a third. The application of this scheme to night work is on the following basis: The first 55 hours are worked at time and a third, as at present, and the sixth day 11 hours at double time.

Bonus for Punctuality Paid on Sales Figures

A very similar scheme is operated by another firm. This firm is working a 59½ hour week on day shifts and a 55 hour week on night shifts. Here again overtime is paid only on the basis of weekly attendance. Where a worker fails to put in a full week without being able to offer a justifiable excuse for his absence, he has to sacrifice a corresponding part of his overtime to make up the deficit. In practice this has been found to reduce the proportion of

wilful absenteeism to an extremely low percentage. Coupled with this scheme, the firm also deprives persistent absentees of all overtime work—a "cure" for absenteeism which, it will be recalled, figured fourth on the list with over 13 per cent. of the total points awarded for remedies.

In north-west London, an engineering firm has introduced a scheme which entitles workers whose attendances are regular to share in a collective monthly production bonus, based on sales figures. These figures are posted up daily so that all employees may have the opportunity of calculating the extent of the bonus. Where a worker persistently loses time, a proportionate amount of the bonus is deducted and is added to the amount to be distributed among those who complete full working hours.

Two Rates of Bonus for Punctual Attendance

A somewhat similar bonus idea, but based solely on the workers' attendance, is in operation at the Birmingham works of an office equipment manufacturer. This firm allows the usual two minutes for clocking in and also permits two half-hour periods daily for clocking-in to start work.

Regulations of this type are, of course, very common, but, as an incentive to punctuality the firm offers a punctuality bonus calculated on the total actual wages earned, according to the hours clocked in for the week. This is paid by an added percentage as follows:—

If full working week (now 49½ hours) has been clocked in (i.e. no time lost at all) . . . 4 per cent Bonus.

If 48½ hours have been clocked in (i.e. 1 hour lost out of the total hours for working week . . . 2½ per cent. Bonus.

Hours clocked in working week which total less than 48½ do not qualify for any percentage of punctuality bonus.

A Scheme to Cover Holidays Without Pay

If worker's record is shown to be consistently good the exceptional case of loss of time (through unavoidable circumstances) although not paid for in wages may not have the effect of prejudicing qualification for punctuality bonus on actual wages earned.

Another bonus scheme is operated by the same firm, this time to cover the days when the production shops are officially closed down for holidays. The bonus is calculated according to the length of time of continued service. Whether or not the works be closed down for official holidays the bonus is paid at the rate of 2½ working days for Easter, one working day for Whitsun, six working days for annual holiday, and 2½ working days for Christmas—a total of twelve working days at worker's rate for a full twelve months' unbroken service and for consistently keeping at work during that time.

This New Technique of Interviewing Tells the Western Electric Company

What the Workers Really Think

WE mentioned that piece work rates were introduced during the first of the Hawthorne experiments* in order to give a greater incentive to individual effort than existed in the group payment system used in the main shop. But the employees were still paid as a group, each having an equal share in the earnings of the group, apart from the layout operator and the observer.

How far was this new and slightly higher rate of pay responsible for an average increase in output of 30 per cent. The management felt that it was urgently necessary to find how far this change in the method of payment secured the 30 per cent. increase in output. So two further experiments were conducted with this object primarily in view.

What the First Experiment Achieved

In the second experiment the additional wage incentive was retained. In what was called the Second Relay Assembly Group, five experienced relay assemblers were chosen and placed together in the big work room. The basis of payment was changed exactly as in the first experiment.

The output of each operator immediately rose as compared with the previous average. After a test period of nine weeks, the girls were put back on the old system of payment for a period of approximately seven weeks.

Under the new payment system output rose by 12.6 per cent; when that incentive was removed it again fell to under the previous average in the base period.

Why the Second Experiment Failed

The variety of work which one operator was called upon to do was probably responsible for this fall in the average output.

This second experiment seemed to suggest that the formation of a small group for the setting of piece rates was an important factor in an increase of around 30 per cent., secured in the first Relay Assembly Test Room. Unfortunately, the second experiment had to be stopped as the foreman found that the presence of a special group in his department annoyed the other

*Second Part of our Survey of the Hawthorne Experiments in Labour Relations. These Experiments, Conducted over Twelve Years, have led to an entirely new Conception of Employee Relations.**

File these Important Articles for Reference when Considering Your Own Labour Problems in War-Time

workers who felt that this group were receiving special consideration.

The Mica Splitting Test Room

In a third experiment, five operators were again put aside in a separate room on mica splitting. Reduction of hours, introduction of rest pauses and finally a five-day, eight-hour week were all used for long test periods.

These experiments were unfortunately conducted during the period when the financial crises of November 30th, 1929, struck American industry. From mid-1929 until the end of the experiments in the autumn of 1930, every worker felt that the job was in jeopardy. This upset the last 15 months of the test. The first ten months of it, however (August 27th, 1928 to June, 1929) showed some surprising results.

- Output fell steadily when the girls were moved into the test room.
- There was a moderate but steady rise in the rate of output when rest pauses were introduced. This rise was maintained until the crisis of 1929.
- Again it was impossible to discover the normal incidence of fatigue.

The output of four operators out of five averaged for the most part within 2 per cent above or below the mean. The output of only one operator showed the normal incidence of fatigue. Blood pressure tests gave the same results.

The one fact that stuck out like a

sore thumb from all these experiments was the apparent inadequacy of normal methods of supervision. I should say that the management staff of all grades in the Western Electric is probably far above the average in the United States. Yet it was clear from each of these experiments, particularly from the first, that few employees had a really happy relationship with their immediate colleagues, with their foremen or with the management generally.

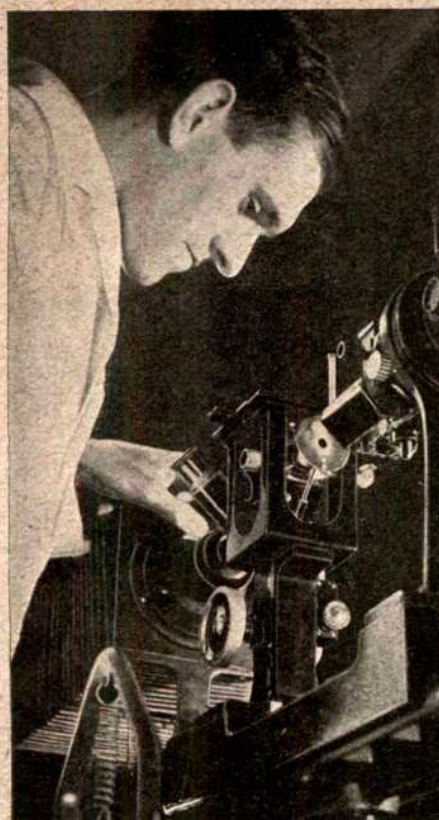
Improved Conditions Developed Greater Interest in Work

Yet for years the Western Electric had specially trained its foremen, superintendents, works managers and others in the Company's routines. During these experiments they had attempted to organise a series of discussions among the supervisory ranks on morale. This series of conferences was a failure because no two foremen, superintendents or managers had the same ideas about what made people happy, or even about what made people work.

It was evident from the Relay Assembly Test Room results that the output of the operators rose independently of the conditions of work. Further, the girls lost much of their shyness or what the management came to call "apprehension of authority." No English manager needs telling how prevalent this is with a certain type of worker living alongside the most independent and even truculent attitude among some of their mates.

The girls working in the test room experiment talked more freely; developed an increasing interest in their

*"Management and the Worker." By E. J. Roethlisberger and William J. Dickson. (Harvard University Press, U.S.A.). Both the Management Library and the Institute of Industrial Psychology have a copy available for loan to members. Otherwise the book must be obtained direct from the American publishers. **Ed.**



work; made friends of the other members of the group; visited one another's homes, had their own parties and theatre visits and worked as a team in the most unselfish and sporting way.

They found that one main reason for this improvement in morale lay in the workers' dislike of the tactics of the

foremen and superintendants. It became clear that some of the methods being employed by some of these officials were undesirable. We know that situation only too well here also.

Breaking Down the Barrier of Distrust

Yet how were the facts to be obtained? How were the workers to be induced to state their case (a) without combining to act against the interests of the management (b) without trying to damage the position of their particular superiors and (c) without trying to curry favour by representing a glowing account of the position.

It was felt that the normal channels of the Welfare Department and the Employment Manager would scarcely yield the results required. The barrier of distrust rarely disappears either in the Welfare Worker's office or at the Employment Manager's desk. This is as true of Great Britain as of America.

How the Interviewing Scheme Was Worked Out

So a series of "questions and answers" interviews was decided upon. The results of this were to be passed on to the departments responsible for conditions. They were to investigate the conditions complained about and to correct them. Further, the data collected from the interviews was to be given to managers, foremen and superintendants for use in their discussions.

The work of the interviewers was arranged on fairly normal lines. Each

interviewer was given a certain section of the factory to cover. He was to go first to the foreman in charge and make his presence known. He was to select his own interviewees, so as to avoid being presented only with the foreman's "problem children."

The interviewer was to cover a wide range of questions. The employee was to be assured that the interview would be kept strictly confidential. The interviewer was to give no advice as to what the worker should do.

The employee was to be paid at his usual rate for the time taken up by the interview.

Control by Interviewer Upset This Scheme

At first the scheme looked like being a big success (September 1928). Many of the workers liked the management's recognition that their point of view was important. Others felt they could have a knock at a foreman they disliked. Some foremen probably quickly improved their methods of dealing with their people. Some employees were suspicious of the whole thing as a stunt. So were many of the managers and foremen.

When the plan has been running for some time, it was discovered that the interviewers were not getting the facts about the workers' point of view. What they were getting was, more or less, a set series of answers to a set series of questions. The interviewer controlled the conversation; the worker followed his lead.

More important still, it was impossible to get any useful information

NUMBER OF COMMENTS ON EACH SUBJECT IN 10,300 INTERVIEWS TAKEN FROM 6,800 MEN AND 3,500 WOMEN OPERATING BRANCH, 1929.

Subjects.	Total			Men			Women		
	Number of Comments.	Favourable.	Unfavourable.	Number of Comments.	Favourable.	Unfavourable.	Number of Comments.	Favourable.	Unfavourable.
Promotion	1,423	607	816	1,240	508	732	183	99	84
Output target	2,093	711	1,382	567	154	413	1,526	557	969
Club activities	3,333	2,954	379	1,513	1,274	239	1,820	1,680	140
Dirt	2,699	1,402	1,297	1,589	784	805	1,110	618	492
Fatigue	2,275	964	1,311	1,011	447	564	1,264	517	747
Furniture and fixtures	1,246	211	1,035	891	145	746	355	66	289
Hours	4,285	2,012	2,273	2,097	957	1,140	2,188	1,055	1,133
Interest in work	1,968	1,850	118	981	905	76	987	945	42
Light	2,598	909	1,689	1,767	613	1,154	831	296	535
Lockers	3,846	306	3,540	2,709	242	2,467	1,137	64	1,073
Material	1,283	42	1,241	728	23	705	555	19	536
Payment	11,803	4,987	6,816	7,892	2,972	4,920	3,911	2,015	1,896
Wages	4,499	3,215	1,284	2,843	1,882	961	1,656	1,333	323
Rate revision	1,767	226	1,541	1,236	137	1,099	531	89	442
Piecework rate	1,713	203	1,510	1,304	148	1,156	409	55	354
Piecework in general	1,225	102	1,123	850	58	792	375	44	331
Judgment	8,827	7,321	1,506	5,072	4,018	1,054	3,755	3,303	452
Canteen	543	357	186	201	129	72	342	228	114
Safety and health	4,029	821	3,208	2,463	552	1,911	1,566	269	1,297
Sanitation	1,105	145	960	605	120	485	500	25	475
Smoke and fumes	1,118	54	1,064	733	30	703	385	24	361
Supervision	4,605	1,868	2,737	2,922	1,116	1,806	1,683	752	931
Savings	5,809	5,504	305	3,181	3,000	181	2,628	2,504	124
Tools and machines	1,584	303	1,281	1,286	258	1,028	298	45	253
Holidays	3,723	3,550	173	2,167	2,055	112	1,556	1,495	61
Ventilation	2,561	1,037	1,524	1,602	626	976	959	411	548
Washrooms	2,352	308	2,044	1,374	222	1,152	978	86	892
Welfare	2,121	1,790	332	1,249	1,030	219	872	769	103
General	135	118	17	66	51	15	69	67	2
Benefit plans	1,383	1,302	81	847	790	57	536	512	24
Employment	262	142	120	123	44	79	139	98	41
Service (continuous)	135	54	81	83	35	48	52	19	33
Publications	43	37	6	22	17	5	21	20	1
Pensions	82	70	12	79	68	11	3	2	1
Loans to employees	26	22	4	17	14	3	9	8	1
Working space	1,042	88	954	662	37	625	380	51	329

DIFFERENCES BETWEEN MEN AND WOMEN IN URGENCY AND TONE OF SUBJECTS DISCUSSED OPERATING BRANCH, 1929.

Differences in Urgency

Differences in Tone.	Subjects twice or more as "urgent" for women as for men.	Subjects of about equal "urgency."	Subjects half or less as "urgent" for women as for men.
Subjects on which women are more favourable than men.	Employment	Personnel organisation Floor	No subjects
Subjects on which women have about the same tone as men	Entertainment Hospital Transportation Christmas Welfare Canteen Ready money plan Savings in general Rest periods Fatigue Club store Welfare in general Quality of material Output target Social contacts Overtime Interest Fans	The 51 remaining subjects not mentioned elsewhere in this table	Tools Trucks Promotion Education Life Insurance Pensions
Subjects on which women are less favourable than men	No subjects	No subjects	No subjects
	Chairs Elevators Spitting		

from the greater number of the workers except on one individual point, usually a grievance. Apparently, this point was normally quite unimportant, if not irrelevant. On examining the results of every interview, however, it was discovered that it was the apparently irrelevant and unimportant points on which the workers really had opinions that influenced their whole outlook on their work.

Complete Freedom of Speech Provided the Solution

Accordingly the method of interviewing was entirely changed. The new method was so successful that it is worth giving it in the words of two of the experts concerned in its invention and use.

"It was finally decided, about July, 1929, to adopt a new interviewing technique, which at that time was called the indirect approach. After the interviewer had explained the programme, the employee was to be allowed to choose his own topic. As long as the employee talked spontaneously, the interviewer was to follow the employee's ideas, displaying a real interest in what the employee had to say, and taking sufficient notes to enable him to recall the employee's various statements. While the employee continued to talk, no attempt was to be made to change the subject. The interviewer was not to interrupt or try to change the topic to one he thought more important. He was to listen attentively to anything the worker had to say about any topic and take part in the conversation only in so far as it was necessary in order to keep the employee talking. If he did ask questions, they were to be phrased in a non-committal manner and certainly not in the form, previously used, which suggested answers.

"This change in method had an important effect on the duration of each interview. In the first stages of the programme the interview was approximately 30 minutes long, but with the change in method the average time for a single interview grew to approximately 1½ hours.

"In October, 1929, a change in the method of writing up interviews followed the change in technique. The

original method of grouping employee comments as likes and dislikes under the headings of supervision, working conditions and job, was supplanted by a method of recording entire interviews as nearly verbatim as possible, showing the comments made both by the interviewer and by the employee.

"This change lengthened the reports from an average of approximately 2½ pages to 10 single-spaced typewritten pages."

So successful were the initial interviews that the scheme was extended to a large part of the Hawthorne works. Finally interviews of the special type were secured with 10,300 workers, 6,800 men and 3,500 women.

Complaints Were Measured by "Urgency" and "Tone"

As will be imagined a great part of these interviews was taken up with the voicing of complaints.

The table on page 14 shows the type of subject discussed, the number of times each topic occurred, the nature of the comment and the variations between the attitude of men and women.

Given this mass of complaints, the important thing was to determine on its *urgency* and on its *tone*. By *urgency* is meant its importance to the worker judged by the frequency of its mention. Among the fifteen subjects most frequently discussed occur supervision, wages, stock purchase plan, lockers, fatigue and ventilation.

By *tone* is meant the degree of satisfaction or dis-satisfaction expressed. There proved to be no clear relation between urgency and tone on the same topic.

Among the fifteen topics which are most often mentioned and, therefore, are presumably more urgent to the workers three (nature of job, stock purchase plan, and holidays) are favourable in tone. Seven subjects (supervision, wages, light, ventilation, dirt, promotion and fatigue) have a neutral tone and five subjects (lockers, safety and health, piece-work rates, wash-rooms and rate revision) are discussed

unfavourably. Curiously enough, say investigators, "although topics having a high favourable or unfavourable ratio vary in urgency, it may be said that, as a rule, most topics which are talked about either extremely favourably or unfavourably are not discussed frequently."

Management Learns Exactly What Workers Want

The subjects talked about by women were as varied in type as those taken up by men. Again there was no correlation between urgency and tone.

On the other hand, women tended to be more critical of factory conditions. Majority of their comments on this subject tended to be unfavourable. Conversely, women's comments on employee relations tended to be favourable. There are some curious differences in the topics of interest to men and women, as shown in the table on this page.

On the whole women are, of course, less critical than men. On three subjects (employment, personnel and floor) women are considerably more favourable than men. Yet there are no subjects on which men are considerably more favourable than women.

But the same subjects are urgent for women as for men. On the whole, however, women talk more about subjects such as welfare, overtime, rest pauses, fatigue, output target, social contacts and furniture and fixtures than men. Men, being more concerned with earning and with their family responsibilities, talk more than women about tools, trucks, promotion, life insurances and pensions.

The important fact is that from these interviews one management has learned precisely what subjects are concerning its workers. It has put a spotlight on the inhibitions, grievances and the general difficulties which are preventing men and women from working cheerfully, for and with the management.

(To be continued).



Modern Machinery is Vital to the War-Time Office

*Up-to-date Equipment will Solve
Problems of Depleted Staffs*

**By the Managing Director of a Leading
London Biscuit Manufacturing Firm**

IN common with all firms not listed as "essential" industries, we are struggling to carry on with badly depleted staffs. But we are luckier than most, in that we mechanised our office in pre-war days and trained our employees to make the most of the very efficient machinery we installed.

Today, we are in the happy position of being able to keep abreast of all current work.

Some years ago, we introduced mechanical book-keeping and with this thing we are able to maintain a day-to-day check on all accounts. But this was only the beginning of our mechanisation. The next stage, taken originally as a protection solely against fire, has developed into a most vital precaution against air raid damage. We installed fire-proof filing cabinets for all our accounts records. Today, with the ever present need for placing all records in protected places at night, we are saved the extensive labour of moving several thousands of account records to a fire-proof safe.

How to Save the Time of Executives and Staff

The dictating machine is another device which has proved invaluable ever since the Services and "essential" industries started to call on staff. All the claims of the manufacturers have been borne out by the use we are able to make of these machines. We should require a secretarial staff nearly treble that we have if we had to rely on ordinary stenographic methods of dictating correspondence.

The valuable time of executives is also saved by keeping them at their desks even when an important conference has to be held. Just what this means in a factory where some executive would have to walk a quarter of a mile to attend a conference and perhaps eight or nine of them have to be together can easily be

calculated. Well over an hour's time in the aggregate is saved by using the inter-communicating telephone system for each conference.

An extension of this means of communication is, of course, the use of public address equipment for calling members of the office or works staff to any office in which they may be required. We have installed microphones and loud speakers for this purpose and are thus able to summons an employee at once, wherever he or she may be, without having first to invoke the assistance of a secretary or telephonist.

Electric Typewriters Save Time and Fatigue

Another electrical system which also aims at saving odd minutes is electric door control. Any executive in conference signals by a red lamp that he is engaged. If the "engaged" signal is not showing, any one wishing to enter an executives office presses a button outside the door. If the man inside is not telephoning or using his dictating machine he can signal "come in." On the other hand, a reverse movement of the switch warns the caller to "stay out".

In our main office everything is done to speed work, yet save fatigue. To this end perhaps our most important device is the electric typewriter. Just what these writing machines can achieve is perhaps best shown by citing the fact that a new world's typing record has just been established on one. The speed maintained to establish this record was one which called for typing for an hour on end at the rate of 13 strokes a second! Such a speed would be impossible with an ordinary manual machine. We have proved that our typists can cut from a third to a half of their time with these typewriters, yet finish their work completely unfatigued.

But, as I said at the beginning, we have not stopped at easing our own work. One of the many systems we have designed to help our sales department is the use of an addressing machine to prepare a salesman's blank order forms in preparation for his calls during the following week. Not only does this save any mistakes in the name and address of the customer but, also it permits us, by a simple code on the addressing plate, to work out a route for the salesman day by day and so establish a fairly accurate place for contacting him on his rounds should this be necessary.

And Here Is Another Time-saving Machine

Here is another machine which is proving itself invaluable in reducing office labour. This rapid electric envelope sealing machine takes envelopes of all sizes and thicknesses and



seals them at the rate of 20,000 an hour.

Its opposite number is an envelope opener. Again capable of dealing with all types of envelopes. When driven by electricity it has a capacity of 1,000 letters an hour. While a hand-driven model can deal with 500 an hour.

The seven forms which are the basis of this progress control system. Forms 1 and 2 contain all essential information regarding the job, material required, etc., while No. 3 is attached to the material when issued from stores. Forms 4, 5 and 6 cover one individual operation on the material, 4 and 5 having on reverse, spaces for clocking on and off. On completion of operation No. 6 goes at once to Progress Department. Form 7 is attached to the finished work when the last individual operation has been completed. A duplicate of this also goes to Progress Department

Full Progress Control Within 20 Minutes of Completion of Job

WAR-TIME conditions have imposed many new methods of production and control on most industries that have converted part or whole of their plant to the war effort. In this company the standardisation of one branch of our production to a single unit has meant that we have had to scrap our old method of checking progress on a job.

Hitherto, we relied on the foreman of a department for information on any production work then in hand. This was understandable, since, in most cases one job bore little or no resemblance to the next and to concentrate progress control in a central department would have meant a staff far bigger than was justified.

Department is Small Despite Volume of Work

Today, however, it is very different. We have concentrated our products and a central progress department—the dream of many industries—becomes not only possible, but a necessity if full control of our production is to be successful. It will give some idea of the scope of the progress department when I state that 5,000 different tools and nearly 10,000 different parts have to be used in the manufacture of one complete unit.

Obviously, with this large number of individual jobs to be handled, decentralised progress control would mean a big waste of time. Yet the central progress department is able to operate with only a staff of four, one of whom is employed solely on the production of job cards. In spite of this small staff and the large number of

This System Gives us Complete Information on Every Detail of Production and Permits Record of Use of every Component

By C. H. NISBET,

Progress Manager, Park Royal Coachworks Ltd.

jobs involved in the production of one single unit, we are able to give an accurate and detailed report on the exact position in the progress of any component in any state within twenty minutes of the completion of the last job on it. What this means in a factory employing several hundreds of workers will be appreciated by all who have tried to check progress under decentralised methods.

Yet the story of how we manage to achieve this is a simple one. The basis of our control is concentrated in ten steel cabinets containing trays of visible index cards relating to every stage in the production of our work.

Material Requisitions and Job Details at a Glance

Each component has its own card, which contains details of the material required for the manufacture of a given batch of components. This master card leads a set of index cards relating to every stage in the production of a component. Each of these cards gives full details of the material required at that particular stage and describes

in detail the work that has to be performed.

Thus, if a job involves fifteen different operations, there is a signal on the card that this number of operations has to be performed. This signal is marked in the appropriate section of a uniformly designed card and works in conjunction with a coloured slide which shows the exact state of production at the moment.

How two Different Batches are Controlled by One Index

We have reversed, however, the method of signalling usually employed. Instead of permitting the slide to come out of the signal as each individual operation is completed, we push the slide back into its cover until when the job is completed the signal is invisible. We introduced this system because we have usually two different batches of work in production at the one time. By using the contrasting colours green and orange, we are able to see at a glance the position of each batch, while the combination of the

two coloured celluloid slides produce a distinctive purple which cannot be confused with the other signals.

From the details on the master card for each component are prepared the job books, which are the secret of the success of the system. These books contain anything from eight to fifty pages, according to the number of individual jobs necessary in the production of the component.

These job books were designed for use by the manufacturers of the reproducing machine on which details of order, design and work to be done are inserted in the printed form. From the master typewritten stencil, also used in the first place to give the details on the master card in the visible file, the various forms are produced. In the course of the average day well over a hundred books are required, so it will well be understood why one member of the progress department's staff is employed solely on this work.

These are the Forms that Make the System a Success

A brief description of the forms will show why the system is so successful. The minimum book contains, as I said, eight forms. These are, in order of binding (1) Front Cover Card, (2) Job Material Label, (3) Material Requisition, (4) Job Card, (5) Operator's Receipt, (6) Progress Slip, (7) Finished Parts Progress Slip and (8) Finished Parts Label. Forms 1, 2 and 3 bear identical information and their titles are sufficient to describe their purpose. Each individual operation to be carried out on the component requires one copy of forms 4, 5 and 6. The first of these is used later for wages control purposes and describes in detail the work to be done at that particular stage. It carries on its reverse side the necessary ruled sections to permit its use for time-recording purposes. Form 5 is a duplicate of this and is issued to enable every worker to keep a printed check on all work he or she may have performed during the week. The sixth form is very similar but does not carry the details of actual period of time taken on the work. Immediately work on any operation is completed, and the worker has clocked off, this slip is sent to the progress department. On arrival there, and the maximum time taken for it to travel from work-bench to the files of the progress department is under twenty minutes, it is available for checking the position on any jobs then under production.

How We are Able to Trace the Use of a Part

There may be, as I explained, up to fifteen different jobs to be done on a single component. When the last of these is completed the finished component goes to inspection and from there to Finished Stores. There the seventh form is detailed and sent to the

Progress Department, while the eighth is used as a stock card and is attached to the batch of components until the next stage in production calls for their issue for further assembly.

The details of the work involved on the assembly of any batch of units is so detailed on these job cards that it is possible for us to trace back through our records to discover the exact units into which any component was assembled. The advantages of this will

be readily apparent when it is realised that in spite of the most accurate and rigid inspection it is occasionally possible for a flaw or fault to evade an inspector's eye because it is concealed in the metal itself. Our records show the ultimate unit into which all other units from the same batch were placed and to pass on to the appropriate user word then component "X" in units "A", "B" and "C" should be inspected immediately for possible faults.

Where Do You Find the Right War-Time Executives ?

(Continued from page 11).

the capacity for seeing far beyond the limits of his own section of the business. He quoted the examples of a number of individuals who seem to have stopped, at least for the moment, because of their lack of capacity to think a problem through the whole of its course, even if it goes beyond their own particular sphere of authority. These same men often lack, also, the ability to delegate and supervise.

In the many dozens of cases studied in the course of this investigation, the one point which emphasised itself over and over again is the breadth of experience enjoyed by men who have only just been promoted to executive rank. They may have started at widely different jobs, they may have come up through altogether different routes, but in almost every case they have seen the business at work, and participated in the work of organisation in its lower stages, so that they are well trained to understand problems as they now arise.

These are the Points to Look For in a Man

Misfits do exist, but in much smaller numbers than may be imagined. Such a man is quickly discovered, if only by the people below him. Discovery means that the lower-grade employees cease to trust the man at the top and production falls off. A simple investigation is all that is then needed to discover the cause.

It would be needless to quote many more examples of the experience of men to whom the war has given the chance for promotion. Much more important are the facts about what is expected of these men, and why they have been selected for the jobs they now hold. The table on this page gives the fourteen main points looked for by nearly three hundred business men when selecting a new executive for

their firms. Details of education and experience as such are omitted from the table for obvious reasons.

It is evident from this survey that the executive of to-day is looked upon as one most likely to be held responsible for the efficient operation of the business, he must be able to maintain profits even though he is not responsible for the financial side of the business and, most important of all, he must be able to make an organisation pull together as a team.

QUALITIES FOR THE RATING OF THE BUSINESS EXECUTIVE

(Education and experience as such omitted)

As ranked by two hundred and seventy-six business men.

Order of Importance.	Quality.
1. Judgment (Reasoning ability, accuracy in conclusions, ability to profit by experience).	
2. Initiative (Alertness, imagination, originality, independence in thinking).	
3. Integrity (Truthfulness, honesty, sincerity).	
4. Organising Ability (Systematising, classifying according to functions, planning and delegating).	
5. Health (Bodily vigour, good sight, hearing, etc., included).	
6. Perseverance (Industry, ambition, concentration).	
7. Aggressiveness (Energy, courage, domination by will).	
8. Open-mindedness (Reasonableness, teachableness, openness to new ideas).	
9. Co-operativeness (Unselfishness, kindness, cheerfulness, tact, loyalty).	
10. Competitiveness (Interest in playing the business game).	
11. Control of Emotions (Freedom from outbursts of anger or touchiness).	
12. Refinement (Courtesy, manners, general culture).	
13. Appearance (Well-groomed appearance, good carriage, pleasing facial express, voice, etc.).	
14. Sense of Humour.	



Seven Short Cuts to Office Economy and Efficiency

Using "Left Over" Publicity Matter

IT frequently happens in the advertising department of a manufacturing concern, that planned campaigns do not consume all the printed material ordered. As a result there is an almost constant, though small, accumulation of miscellaneous envelopes, circulars, booklets, cards and other forms of stationery.

To do away with the waste of this material—a very costly item at the present time, with printing difficulties and paper shortage—the publicity manager of one firm created a "morgue." This consisted simply of a wall placard upon which were posted samples of all old stock. The array of "left-overs" he kept in constant view to encourage suggestions as to how the material could best be disposed of in the department. Often he is able in this way to find an effective use for the superfluous material, and to make profitable sales from it.

Attracting Old Business to New Premises

A MERCHANT who had to move owing to his premises being damaged in a "blitz", minimised the usual drop in trade and made capital of moving by displaying this large poster: "To repay our customers from the slight inconvenience of looking us up at our new premises, we will make a sweeping reduction of 10 per cent. on all goods bought during the first fifteen days in our new quarters." Below this he displayed a chart showing a dotted line from his old to his new premises.

This plan helped him to keep a large proportion of his old customers and directed a considerable number of new ones in the district to the new shop, thus making up for his discounts.

Stopping Losses By Damage To Equipment

CARELESSNESS in handling equipment may be painlessly weeded out of an office. One firm achieved this by issuing a special equipment book which stated the price of every item of equipment in the office, and the normal amount

allowed for annual depreciation and upkeep.

Whenever a breakdown occurred the employee responsible was required to turn in a memorandum which tabulated the description of the machine, the office manager's assessment of the damage or the estimated cost of repair and the employee's signature. While the cost of the damage is not charged against the employee, this procedure does impress the employee with the cost of the equipment and with the fact that a record of damage done is on the file.

How To Keep Paper Covered Catalogues Intact

THERE are few things in an office so short-lived as catalogues and similar paper-bound volumes that must be kept about a desk. The corners are the first part to go, and when they become torn or dog-eared the book disintegrates.

A simple cure for this is to take any publication, when new, open it at the middle and then bend up the four corners of all the pages so that when the book is closed they curve inward. They will stay in this shape indefinitely. Frequent handling will not damage the pages, and they will remain in perfect condition for some months.

Sorting Simplifies Daily Invoice Filing

ONE company which handles about 35,000 invoices a month has reduced the cost of filing these by more than 50 per cent. The invoices are sorted daily and accumulated to fine alphabetical and name sequence. Formerly two clerks were occupied full time on this filing operation. Now, with the new accumulative method, one girl handles the whole operation in less than two hours of each working day. The bulk-filing operation, of course, requires a little additional time.

Formerly, look-ups were quite a problem on this filing job. Under the new plan look-up facilities have been considerably simplified. For example, it was taking two girls full time to get invoices into the files each day. That meant there were no look-up facilities for at least a whole day on some of the volume. Now

all the volume is in the sorter within two hours. Since invoices usually are released for filing in batches, they are available for look-up practically as quickly as they are received for the filing operation.

Office Follow-up For Salesmen's Prospects

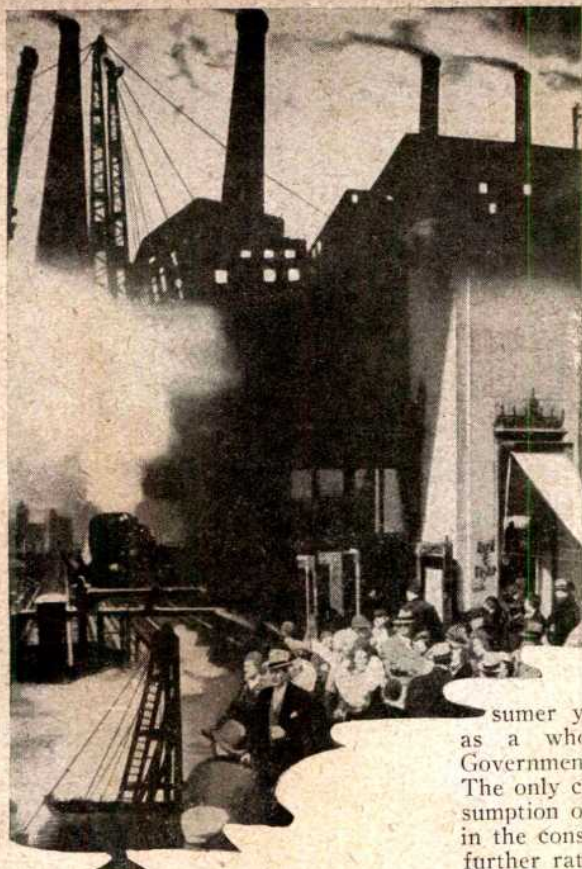
ALL salesmen have a certain amount of pending business and usually in the form of written quotations. It is necessary to follow up these quotations lest a competitor slip in. But to follow it up with personal calls not only takes up the salesman's time but is often objectionable to the customer and the salesman could be devoting his time elsewhere.

One firm has assigned a systematic "follow-up" system to someone in the office who is pleasant of voice and diplomatic in manner. It is often possible to make important appointments for the salesman as well as keep in close touch with the proposition, and in this way, the business does not get placed elsewhere without the firm getting a fighting chance.

Duplicating Machine For Captioning Photographs

PHOTOGRAPHS used in large quantities by publicity departments are customarily captioned by means of a narrow strip of paper, on which the caption is typewritten. The narrow strip of paper is then pasted to the back of the photograph. This time-consuming operation is eliminated by the publicity department of one big firm. Instead of a slip of paper, all captions are transferred to a stencil and the actual photographic prints run through the duplicating machine, which prints the captions directly on the back of the photograph.

This plan saves the use of paper, eliminates the slow labour of pasting the captions on the back of photographs, and guarantees that the caption will never become separated and lost from the photograph. The only possible disadvantage is in cases where photographs are used in layouts and are glued down to mounting boards before they are sent to the engravers. But this is very small compared with the general advantage gained.



AS I write, returns of shop sales for August are not yet available. There seems to be no reason to doubt, however, that they will continue to record an even steeper fall than July (10.3%). The only question is how much further home trade must be sacrificed to meet the needs of war-time production.

What the Russian Agreement Means to Business

THE agreement that we and America are to supply Russia "with practically every requirement which the Soviet military and civil authorities ask" means further change in our own internal policy. We shall help to make up the losses sustained by the Soviet industrial capacity. Partly these supplies will be taken temporarily from those produced for our own use, but only partly. In other words, production must be stepped up to make up part of this loss.

This means a greater production of war materials such as tanks, planes, guns, ammunition, motor vehicles and light arms.

And this increased production must be considerable and it must be got quickly. It will certainly mean still further reduction in consumer goods and in consumer imports. At the same time it will mean a rise in the national wages bill because more people will be employed on war work at relatively high wages. In short, the danger of inflation will be sensibly increased.

One result may be further shortages in shops and further price rises. This can only be avoided if purchasing power is further restricted. How is it to be done? So far the Government is silent

on the subject but assuredly neither subsidies to keep prices down nor price fixing will solve the problem. Indeed, both simply release more money for competitive spending. Consumer will bid against consumer yet more keenly, consumers as a whole will bid against the Government for available production. The only cure for this fall in the consumption of goods coupled with a rise in the consumer's purchasing power is further rationing and/or further compulsory saving on the lines of Mr. Keynes's "deferred payment" initiated in the last Budget.

Inevitably the concentration programme will have to be broadened to include other industries and the present plan will need to be pushed forward with increased energy. Some shopkeepers will be sacrificed, some more wholesalers and manufacturers will be put out of business. Yet for this grim prospect there is no remedy.

Can the Profit Incentive Be Restored?

IT is, therefore, of curious moment that some newspapers and economists have taken to launch a campaign to extend the profit incentive. Obviously, increased wages to the worker under such a scheme could merely exist of I.O.U.'s. Similarly, increased dividends for share-holders must be issued in the form of uncashable vouchers.

The case for a reduction in E.P.T. from 100% to 80% is a valid one. The average business is not in a position to build up its reserves for current depreciation let alone post-war expansion. But to link this reasonable demand with a complete programme for increasing the profit incentive shows a lack of foresight and of common sense.

Progress of Concentration Is Slowed Up

THE progress of concentration has been temporarily slowed up in many industries. In wool, for instance, even the announcement of the nucleus firm's plans seems to have been held up in many cases. Nobody knows how far the industry is to be concentrated under

the second compulsory scheme.

In the rayon industry, the Limitation Orders have been drastically altered. 70% of weaving yarn output is to be allotted to the home trade, the balance only being for export.

In some industries, like hosiery, concentration is almost completed. In others like pottery and carpets there seems to be doubt as to whether concentration will be applied at all.

I think many manufacturers preferred Capt. Oliver Lyttleton's downright methods and driving energy to the paralysing delays of his successor.

Export Policy in the Melting Pot

THE fifth phase of the Government's export policy is certainly the worst. Personal protests from President Roosevelt as to the delicacy of his situation over Lease-Lend materials have certainly caused activity at the Board of Trade.

No Lease-Lend materials must be used for manufacturing goods for export. The banned list includes all ferrous and non-ferrous metals, with steel prominent, cotton, silk and a wide range of other materials.

This stops the export of some famous lines including bicycles, steel shafted golf clubs, Sheffield cutlery, Liberty scarves.

Indeed, none of these products may be even advertised for sale in export periodicals or editions. For these paper will no longer be supplied by the Paper Control.

My own view is that the Board of Trade has fallen backwards in its effort to stand straight on the possible mis-use of Lease-Lend materials. In this case we may hope to see some reasonable relaxing of these drastic regulations after the American newspapers and politicians have simmered down.

For these regulations, if carried to the extreme, would cripple much of our South American and our Empire trade; and without this we cannot earn enough dollars even to pay for what we need outside Lease-Lend. It will not pay even America to kill the goose that lays the golden eggs to-day. Nor will a bankrupt Britain with no foreign revenue be of much use to America in the work of re-constructing the world.

TREND OF TRADE

Aid to Russia means big Production Step - up

Says CECIL CHISHOLM, M.A.,

Business Consultant

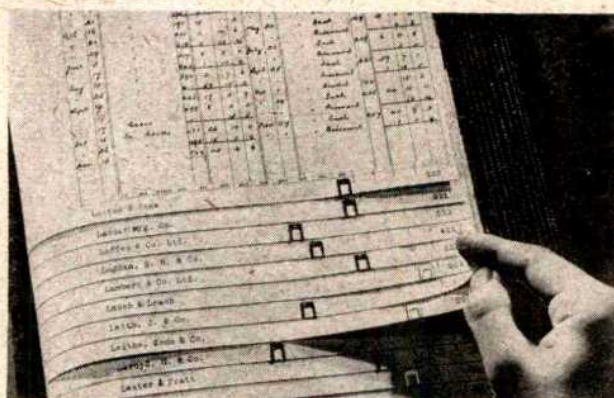


JUST THE TICKET!

The speed with which your bus conductor issues tickets is convincing proof of the advantages of their "Visible" arrangement. Each denomination of ticket can be seen at-a-glance. Were they behind one another or in a book, or box, imagine the confusion there would be at rush hours.

In your offices and works are the titles of your accounts and records visible, or are they in a book or tray one behind the other?

Kalamazoo Visible Equipment consists of secure Loose-leaf binders, the records being arranged in overlapping formation. Thus the titles and all other important information is visible without even turning over the record.



(Proprietors, Morland & Impey, Ltd.) (Sales)
Kalamazoo Ltd.

NORTHFIELD • BIRMINGHAM 31

Kalamazoo
Visible Equipment

Industrial Production Equipment

NEW

22 CHAIR FOR FACTORY ROOF SPOTTERS

A well-known manufacturer of special office chairs has produced an excellent balanced, automatically adjusting, swing roof-spotter's chair. This "Jim Crow" spotter's chair is designed to give a sweeping view of the sky in every direction. It swings in a complete circle at a touch

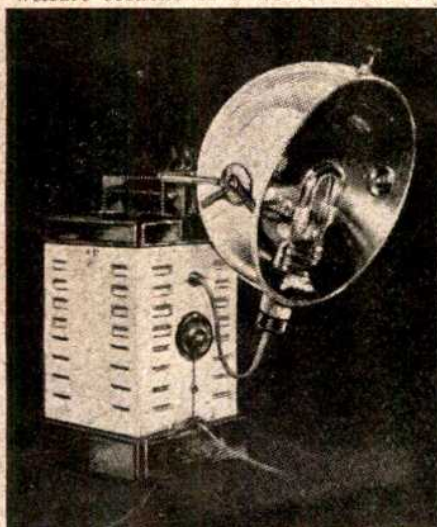


The "Jim Crow" spotter's chair

of the foot, revolving on a bronze bearing. The seat is of hard-wood, heavily enamelled. The seat slats are copper riveted to a steel frame. The rexine covered head-rest is shaped to support the neck when spotting overhead, thus avoiding neck crick. If the chair is not to be fixed to the ground (or roof) it is supplied with flat cross steel skids.

23 PORTABLE ARTIFICIAL SUNLIGHT LAMP

A new portable artificial sunlight unit has just been introduced for use in various welfare sections of a works where con-



Portable artificial sunlight lamp

ditions or demand do not permit the installation of a permanent sunray battery.

for Welfare, Factory ARP and Power

●Readers are invited to make use of this valuable information. The name and address of the manufacturer of any product described may be had on application to the Editor, BUSINESS, Whitefriars House, Tallis Street, London, E.C.4. To simplify your request you may refer to the items by number only.

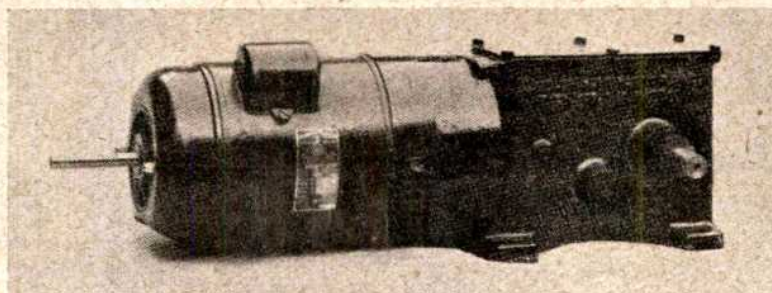
●Manufacturers and distributors are invited to send complete information about their new products for inclusion in this feature.

24 NON-FLAM VIZORS FOR SPECTACLE WEARERS

Vizors of industrial face screens are now being produced with renewable non-flam celluloid windows. The device can be worn over spectacles. Special models are made with glass behind the celluloid for welding, etc.

25 SHELTER VENTILATION UNIT WITH DUAL DRIVE

A.R.P. ventilation units, designed for service for 50-person and 100-person shelters, are now being produced so that in cases of electric power failure they can be instantly converted to human drive. A $\frac{1}{4}$ h.p. motor or one man drives the 50-person unit; a $\frac{1}{2}$ h.p. motor or two men drive the 100-person model.

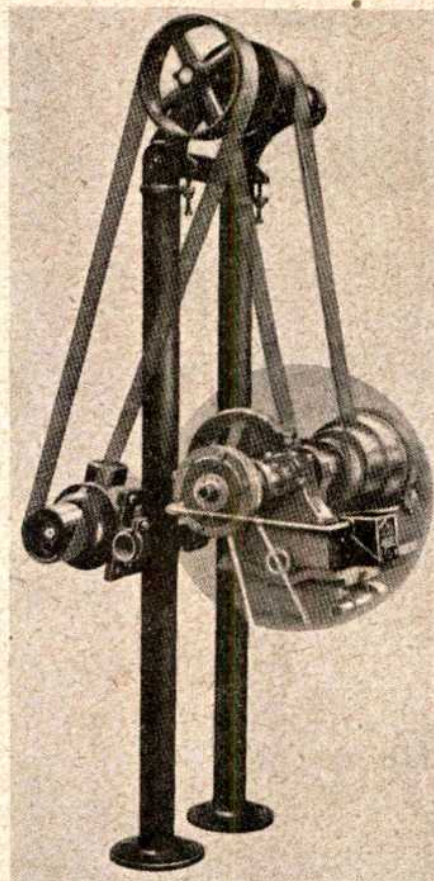


One of the new shelter ventilation units which can be driven either by electricity or man-power

NEW

26 PUSH BUTTON CONTROL OF MOTORISED UNIT

This self contained motorised unit drives any cone-pulley machine. It is



Self-contained motorised unit for driving cone-pulley machines

controlled by electric push button. Power is furnished by a totally-enclosed fan-cooled 3 h.p. 50-cycle motor.

Speedier Time Recording

23



with the New "MAGNETA" TIME RECORDER

Note these advantages:

- ONE HAND OPERATION
- COMPACTNESS
- QUICKER DISPERSAL OF STAFF
- ACCURACY

The MAGNETA Time Recorder prints full size records on standard time cards, and can be supplied as an independent unit to operate from A.C. mains with controlled frequency, or incorporated in an installation operated from a Master Clock. Metal Card Racks supplied finished to match Recorders.

THE MAGNETA TIME CO LTD
GOBLIN WORKS, ERMYN WAY, LEATHERHEAD, SURREY

TELEPHONE: ASHTEAD 866 (8 LINES)

LONDON OFFICE:

53/54, HAYMARKET, S.W.1.

Telephone: ABBEY 2366-7

For Literature and Details of
Installation, write or telephone

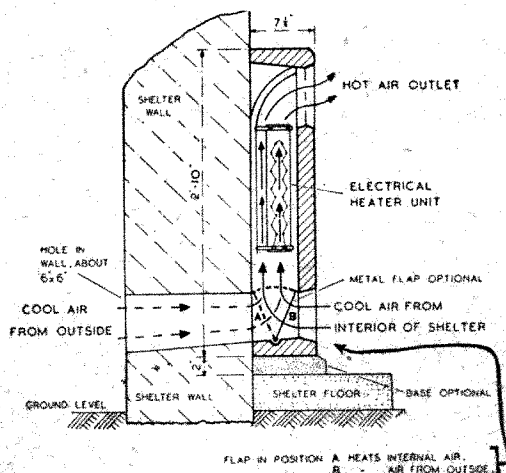
ELECTRIC HEATERS for PUBLIC and INDUSTRIAL SHELTERS

Heavy Precast Concrete Casing with
fixing lugs for bolting to wall. Sup-
plied with or without Electric Element.

Standard Electric Element of 1½ Kilo-
watts sufficient to heat shelter of 1500
cubic feet capacity. 1 kilowatt element
supplied if desired.

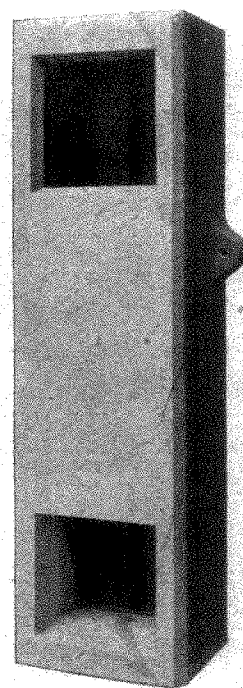
Heating installations for shelters should be decided on now. Do not wait until the
winter months before ordering such equipment—we can give immediate delivery.

The STENT Shelter Heater is economical, efficient and simple.



SHOWING THE
SPECIAL
AIR-FLOW
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Send to-day for full details:

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Tel.: Whitehall 2678

INDUSTRIAL PRODUCTION EQUIPMENT

These are the Economies with Fluorescent Lighting . . .

WHEN two years ago fluorescent lighting made its bow to the world many people were inclined to dismiss it as only another decoration for shops, fairs and advertising displays. But in those two years it has established itself as the most revolutionary and most efficient form of lighting for factories, offices, shops and other large areas that have to be well lit.

This kind of illumination has long been the dream of lighting engineers. For fifty years electric light has been produced by passing current through a wire, which was thus heated until it glowed. Even in the most efficient of filament lamps 90 per cent. of the current is wasted in heat. To create a more efficient lamp, therefore, laboratory research men had to start all over again on an entirely different task.

Cooler Operation Saves Ventilation Worries

Finally someone hit on the idea of caging ultra-violet light and a fluorescent material, i.e. one that glowed when exposed to ultra-violet light, in a glass tube. And thus the fluorescent lamp was born.

In its comparatively brief life it has already proved that it has the following advantages:

- (1) light-efficiency more than twice that of the ordinary filament bulb;
- (2) lamps have twice the life of the present type bulbs;
- (3) has the same colour characteristics as natural daylight; and
- (4) makes no heat: all energy is light.

The fluorescent lamp is cooler, easier on the eyes and vastly more efficient than any other light. Its coolness reduces the cost of air-conditioning. In the home, fluorescent light is still in its infancy but when national conditions permit it may be expected to provide modern homes with its glareless light.

What a London Office Test Showed

Not long ago tests were conducted in an office in the City of London to determine the advantages of this new form of lighting.

The office was an ordinary modern one such as any executive might have, with a superficial area of 200 sq. ft. There were no windows or external lighting of any kind. Artificial lighting

was therefore necessary during all working hours.

This was formerly provided by three wall bracket fittings (gas-filled, filament bulbs) consuming a total of 600 watts. This arrangement yielded a very pleasant, almost shadowless lighting that did in fact rouse the favourable comment of most people who saw it.

Two large-dial meters in this office were placed for all to see. One registered the amount of electric current being consumed, the other registered the foot-candles of effective light.

Under the old system of lighting these two meters showed respectively that .6 units per hour were being consumed and that 5.5 foot-candles of light were effective on the work surfaces (i.e., the desk, etc.).

Now, at the touch of a switch the old filament lighting was put out and the fluorescent tube lighting brought on—not fully, but first half the installed length of the tubing and finally, after a pause, the whole of it.

The Cash Side of What this Lighting Means

The change was literally amazing. Apart from the complete alteration of the character of the light, the reading on the current consumption meter fell to .16 units per hour, while the light recording meter jumped to double its previous figure. Then, with the fluorescent tube fully functioning the light recorder showed yet a further 100 per cent. increase of effective light output while the current consumption barely touched .32 units per hour.

Thus, four times the light of an infinitely better quality was revealed at a cost, for current consumption, of half that which was necessary before.

Let us see what this means in practical £ s. d.

To consider capital and operating costs there must be at least one common factor. Assume, therefore, that we want to obtain the same amount of light with the new type lamp as existed with the old indirect tungsten filament system. This can be done with one 5-foot length of fluorescent tubular lamp.

Twice the efficiency, twice the life of present-day bulbs, less eye-strain are only three of the advantages of this new form of illumination

The City of London tariff is £12 per kilowatt per annum and .6ths of a penny per unit. The light in the office described above is used 10 hours a day and roughly 275 days a year, which is 2,750 hours a year. Therefore:—

The Old System Costs

	£	s.	d.
0.6 KW at £12 per KW per annum	7	4	0
Units consumed, $2,750 \times .6 \times \frac{1}{100}$ d.	4	5	1
	11	9	1

Life of Lamps: 1,000 hours.

Fluorescent Tube System Costs (For the Same Light Output)

	£	s.	d.
.08 KW at £12 per KW per annum	0	19	6
Units consumed, $2,750 \times .08 \times \frac{1}{100}$ d.	0	11	6
	1	11	0

Life of Lamps: 2,000 hours.

The capital cost to instal the change-over from one system to the other in this particular office is £7. It is obvious however, that the capital expense of installation is dwarfed by the permanent economies introduced. According to the latest list of one leading manufacturer, a 5 ft. fluorescent tube costs 36s. 6d.; while fittings for walls and ceilings range from £1.100 to £5.80.

Improved Character of Light Saves Eye-strain

But cash economies in running costs by no means exhaust the advantages of the fluorescent tubular lamp. The character of the light given and the way in which it is given (i.e., from a considerable area instead of a concentrated point, as already described) are of enormous benefit.

The character of the light providing, as it does, the quality of daylight, is far more helpful than other forms of artificial light to the eyes of workers in offices and factories. This vital factor lessens the tendency to that eye-strain which leads directly and indirectly to fatigue and a host of petty illnesses that bring about, in total, so many lost working hours.

PRODUCTION CONTROL . . . CO-ORDINATION PLANNING

The call of to-day is for PRODUCTION, MORE PRODUCTION and STILL MORE PRODUCTION. Output at its greatest volume and its lowest cost, and this means that every facility, in the way of men and machines, must be measured and assessed against demand in the form of operational time, etc. It means the creation of a Management plan and the employment of such Management Methods and Equipment as will provide correctly and quickly just that data on Purchases, Stocks, Departmental Loading, Progress, Maintenance, Costs, etc., which Managements need to reach speedy, accurate decisions.

LET COPE-CHAT HELP YOU

FRONT COVER PICTURE

Shows the simple readily understood type of punched card, by means of which juniors of average intelligence can speedily provide accurate management data on Time and Materials Control, Progress, Costs, etc. No expensive or complicated machines are used and the low cost is for cards only.

The creation of such a plan and the provision of the necessary methods and equipment is just the type of job in which Cope-Chat specialise, whether it be a comprehensive co-ordinated plan for a large works or merely the bringing "up to scratch" of a "backward" department.

Cope-Chat methods and equipment cover Machine Posting, Visible Records, Punched Card Systems, Loose-Leaf, Continuous Stationery and Manifold Sets and Forms of all kinds. Cope-Chat have 50 years of intensive experience and many hundreds of satisfied clients of all sizes in many industries. They can co-operate with you to your advantage.

Why not "CALL IN COPE-CHAT"

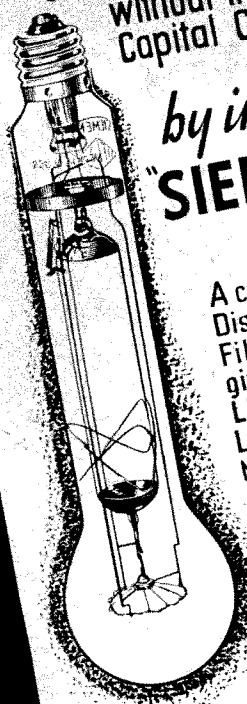
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BRANCHES THROUGHOUT GREAT BRITAIN

? How can I improve my
FACTORY LIGHTING
without incurring high
Capital Cost?



by installing
**"SIERAY-DUAL"
LAMPS**

A combination of Electric
Discharge and Tungsten
Filament in one Lamp.
giving UP TO 50% MORE
LIGHT than gasfilled
Lamps of equal wattage.
No choke coil, condenser
or re-wiring required.

WRITE FOR
CATALOGUE
No 534

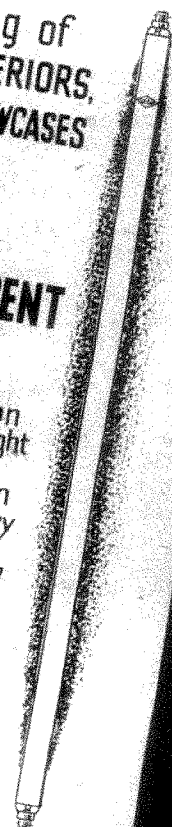
SIEMENS

SIERAY

For the Lighting of
**OFFICES, SHOP INTERIORS,
SHOP COUNTERS, SHOWCASES**
etc.

Instal
**"SIERAY" FLUORESCENT
TUBE**

It provides an illumination
approximating to natural daylight
with these advantages:
1. Light Efficiency more than
TWICE that of the ordinary
Filament Lamp.
2. Lamps have life of approximately
2000 hours.
3. Cool in operation.



FREE ADVICE WE WILL GLADLY
SEND A LIGHTING ENGINEER TO ADVISE
YOU ON A LIGHTING LAYOUT USING
EITHER

SIEMENS

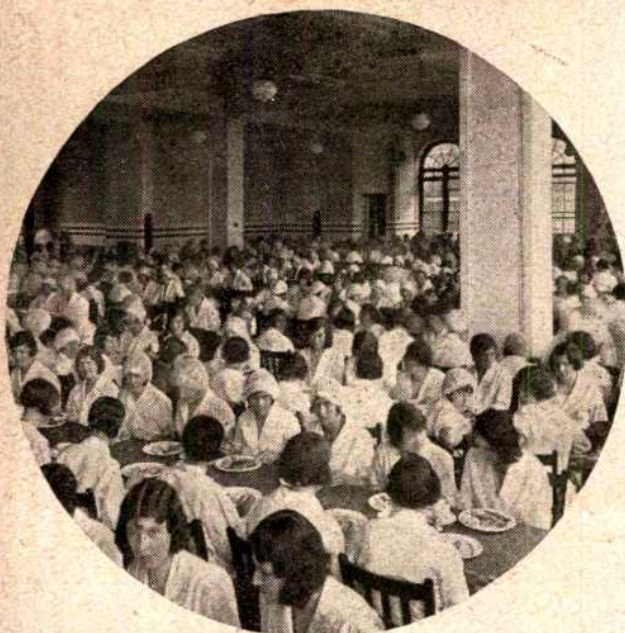
TUNGSTEN FILAMENT LAMPS
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INDUSTRIAL PRODUCTION EQUIPMENT



Fifteen Points for the Canteen Manager

Control of an Industrial Canteen is an exact science. On its success depends the health, happiness and working ability of thousands of workers

By C. E. M. LIDDLE,*

Canteen Manageress, Mather & Platt Limited, Manchester

THE conditions of an industrial canteen are totally different from those of a restaurant or hotel where the demand for mid-day meals extends over a period of two hours or more. In the industrial kitchen the demand is almost instantaneous and at a peak for about ten minutes. Consequently a most generous equipment has to be provided in the way of ovens, hot plates, vegetable steamers, etc.

Workers Must Not Think "It is Just a Canteen"

In an industrial canteen one must accept the old adage that "the customer is always right." One, of course, has to contend with the chronic grumbler, but generally speaking, this class of diner is in a minority. It is so very easy to slip into the idea that "it is only a canteen," and that is where the popularity of many canteens fail.

A worker should not have to eat his

meals whilst still grimy from his labours—a washplace should be provided, where at long troughs provided with a number of sprays, he may take a refreshing wash before proceeding to his meal. Soap and clean towels every day should be furnished free.

I find that the best form of administration is for the works' dining room and laundry to be controlled by a sub-committee of the Works' Committee. The staff canteen is administered by a committee appointed from the members of the staff.

Kitchen Planning is the Key to Success

The question of heating medium is a debatable one. In my own canteen no fuel is burned in the staff canteen, steam being laid on for washing purposes and for supply of hot water, etc. The whole of the cooking is electrical, whilst in the works a gas equipment is employed.

The service, table appointments, etc.,

in a canteen should be of restaurant standard.

Adequate ventilation should be regarded as important, especially in the kitchen, thereby keeping the premises free from excessive odours and heat, which have a vital effect upon the staff and cause consequent inconvenience to diners.

The kitchen is the nerve centre of the canteen, and if it is to be run efficiently, its arrangement should be a matter of careful planning. It is essential to have easy access to the store room and dining rooms; the equipment should be conveniently placed from a labour-saving point of view.

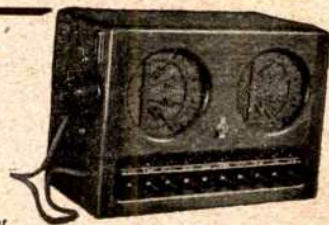
The Manager Must Have Wide Catering Knowledge

The responsibility of running the canteen may be in the hands of a manager appointed by the firm, supported by an employees' committee, or it may be in the form of outside (Please turn to page 32).

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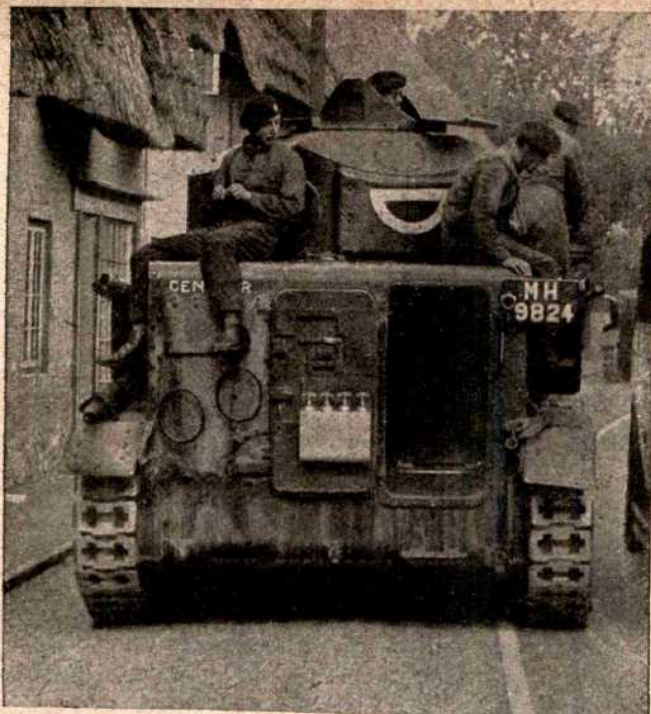
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So cotton service dress and overalls issued to men in the Forces are made of cloth that is commercially shrunk to a specified standard. This standard of resistance to shrinkage is a very high one. It corresponds closely to what has long been associated with "Rigmel"-Shrunk in civilian cloths.

The diagrams below show the accuracy of "Rigmel" compared

with many so-called shrunk cloths, and indicate its great reliability.

Overalls that don't shrink in spite of repeated washings are as vital to the efficiency of your workers as they are to the men in the Forces. They're more comfortable, more hygienic. They don't restrict movement. They look smarter and, of course, they wear considerably longer.

Why not see your suppliers about "Rigmel"-Shrunk cloth? Ready-made protective clothing in "Rigmel"-Shrunk is also available from retail outlets.

COMPARE THESE DIAGRAMS

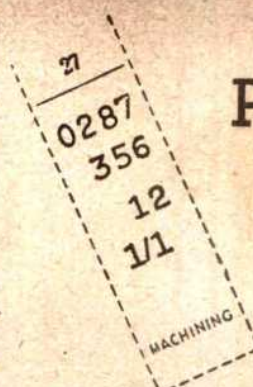
Cotton overall cloth that is "Rigmel"-Shrunk won't shrink more than a fraction of an inch in a yard.

Some so-called "shrunk" "fully-shrunk," and "guaranteed unshrinkable" overall cloths shrink by as much as 2 inches in a yard.

"Rigmel"-Shrunk
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POPPY DAY

NOVEMBER 11th.

Industrial Production Equipment

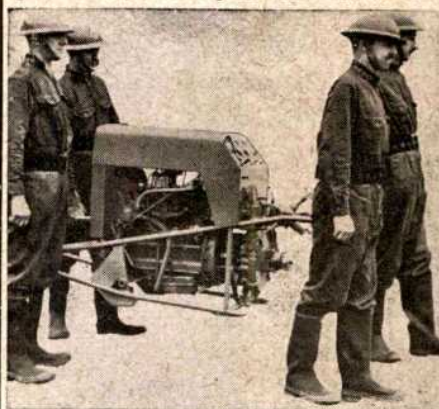
Two New Developments for Factory A.R.P.

RUNABOUT PORTABLE FIRE UNIT

This trailer fire pump embodies a removable pump and engine unit with handles, which makes it possible to carry the apparatus for a short distance. For this reason it would be particularly useful in many factories and industrial organisations.

The following points of interest occur in the manufacturer's specification:—

(1) The frame of the trailer is of high grade steel, carefully balanced on the axle



The new portable pump and engine removed from trailer unit

to give the best position for towing and manoeuvring;

(2) The engine and pump are mounted as a complete rigid unit on flexible mountings on the steel frame;

(3) The stretcher has a tubular frame, strongly but lightly built, upon which the pump, engine, petrol and water tanks are mounted;

(4) The unit can be lifted free from the trailer and carried for a short distance by four men;

(5) The stretcher is also fitted with small, rubber-tyred wheels to enable the apparatus to be wheeled on level ground.

TRANSPORTABLE SHELTERS FOR FIREWATCHERS

With the new Fire Watching Prevention (Business Premises) Order, 1941, more fire-watchers will have to be established, often in dangerous positions, and a new sectional shelter just introduced offers much needed protection to persons engaged on this duty. Except for its manufacture in sections, it resembles in every way the bell-shaped shelter which has proved very popular all over the country.

It is made in two sections, and fitted together by means of bolts through strongly welded lugs. Its great advantage lies in the fact that it can be negotiated through narrow passages, trap-doors, etc., the minimum space required being only 2 ft. by 4 ft. For easier transportation the door is also detachable.

Interior details are similar to the standard model including two seats and shelf for telephone or alarm system. There are four slots placed at eye level, enabling the spotter to obtain a clear vision of the sky from various angles.

INDUSTRIAL PRODUCTION EQUIPMENT

Beating the Noise Bogey

Ear-plugs Solve the Problem

NOISE to human beings has something of the effect of fine grit in mechanical bearings—it is an insidious enemy, always militating against efficient running, and in the end often causing complete breakdown.

The Industrial Health Research Board, whose secretary is Air Vice-Marshall Sir David Munro, operating under the Medical Research Council, has conducted exhaustive researches into the whole question of the effect of excessive noise on the energy of workers.

To quote a simple result out of very many: it was established that in a weaving shed of a certain textile concern the noise of machinery lowered mechanical output by at least three per cent., and this represented an *actual* loss of 7½ per cent. of physical energy by the operative himself.

But throughout thousands of factories and workshops today mechanical noise maintains a terrific assault upon workers' ears. It frays the nerves, produces bad temper, loss of concentration, headaches and even eye-strain. It saps the whole physical tone of the body.

'Outside' Noises Just As Great An Enemy

It is bad enough that this sort of thing happens at work; but it happens everywhere else too, spoiling rest and preventing recovery from the jangle of the factory. There are the outside sounds that penetrate into homes from the street. Traffic, hooters, gear changes; milk deliveries inseparable from bottle and wire, basket clangings; railway whistles, where the house is situated near a railway line, and so on. Such are the noises every ordinary individual has had to accept as part of everyday life. Added now, at any time during the day and night, is the drone of aircraft, sounds of gun barrages and the crumps of bombs that stir up apprehensive feelings. Associated with such sounds are involuntary pictures of destruction, suffering, mutilation. None of them pretty or re-assuring.

Adequate rest is imperative if war workers are to carry on their work without lowering output; rest is necessary to children who continue to grow fast even though a sound night's sleep may be denied them; rest is indispensable to the countless women who maintain home life under difficult circumstances; in short, rest is needed by all workers—factory, transport, office and so on.

Ear plugs as a remedy are becoming increasingly necessary. At the headquarters of the Industrial Health Research Board in the School of Hygiene and Tropical Medicine are

specimens of ear plugs ranging from a fairly intricate type which costs between four and five shillings a pair down to ordinary plugs of wax and cotton wool.

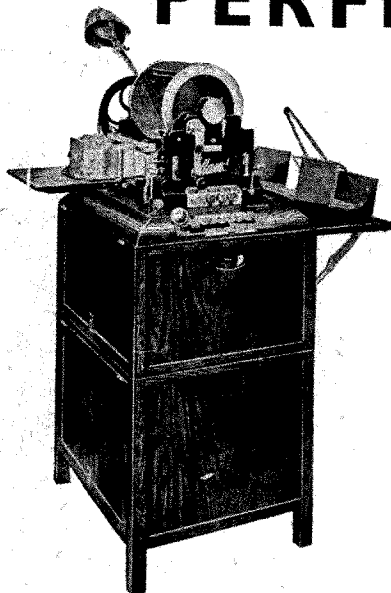
Only Properly Designed Ear Plugs Are Efficient

Wax however melts. Cotton wool becomes dirty. It may easily infect the ear drums. Some rubber ear plugs are merely ugly. They stick out. They look like round blobs pushed into the ears. One type, however, introduced by a well known company seems to be the most practical since it is a rubber plug anatomically designed, not only to fit the inside of the ear, but also to lie

snugly and inconspicuously in the visible part of the ear.

Discussing the question of whether personal immunity from noise can be established by factory workers the Board says in its report: "Tolerance of noise can be established in some measure, but chiefly in a psychological sense. It is possible to become so accustomed to noise that consciousness of its subjective effect—irritation, annoyance, distraction—ceases or becomes much less acute, but some of its effects remain and are revealed only by objective measurement. Excessive noise is to the human mechanism very much as excessive friction is to the machine—it wastes energy."

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INDUSTRIAL PRODUCTION EQUIPMENT

NEW METHODS HELP TO INCREASE OUTPUT

High-Speed Welding is one Solution to Step-up Engineering Production

By S. G. P. de LANGE, M.Inst.W.,
and E. S. WADDINGTON,
M.Inst.W., A.M.I.E.

NEW angles of approach can be quite as important as new processes and methods to increasing production, especially in engineering, armament and other similar industries.

Owing to the vital need of rapid development and the fact that the speed with which any method of production can be put into operation, is of primary importance, the most successful methods are adaptations or improvements on existing methods rather than completely new systems or revolutionary ideas.

With this in mind we arranged to conduct a series of experiments as to the possibility of obtaining a substantial

give increased production, they do not comply with the stipulations referred to above.

This left the following possibilities for investigation: (a) the use of normal electrodes with increased currents and higher operating speeds; and (b) the use of electrodes with a high depositing speed due to the type of coating employed. Investigation of the theoretical depositing speeds of such electrodes showed that results were likely to be obtained which were so striking that they justified a complete investigation.

Having arrived at the theoretical solution of the problem, the next step to

This table gives details of the nine tests conducted to prove efficiency of new high speed welding method. The average number of man-hours saved in the tests was 21.712

No. of Test.	Average man-hours saved (based on average of slowest and fastest normal electrodes).	Average percentage of saving (based on slowest and fastest times).	Average saving in wages at 2/- per hour.
1	9.305	32.9%	£ 930
2	10.278	21.2%	1,027
3	11.805	24.1%	1,180
4	15.972	38.7%	1,597
5	24.306	26.1%	2,430
6	17.222	21.1%	1,722
7	11.945	33.1%	1,194
8	43.333	27%	4,333
9	51.250	46%	5,125

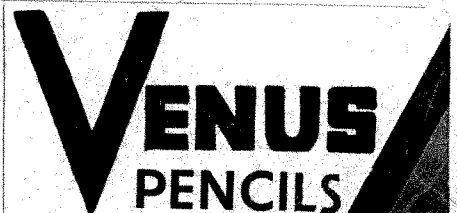
increase in welding speed. It was decided that the line of research should be bound by the following limitations:—

- (1) that the methods would enable existing personnel to be used;
- (2) that the cost of production was not increased, but preferably substantially decreased;
- (3) that existing machines and equipment in the average works could be used with a minimum of additions, and that such additional equipment was of a nature which could be obtained with reasonable delivery or fabrication in the works themselves;
- (4) that the process could be applied to all types of firms and to shop as well as yard work and site fabrication.

How the Basis of Experiment Was Determined

In view of these limitations a number of processes and methods such as automatic welding, the use of very heavy electrodes with heavy currents, were rejected as, whilst these processes undoubtedly will

decide was the specification of high speed electrodes compared with normal types. So as to eliminate the human element, since it is obvious that the actual amount



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INDUSTRIAL PRODUCTION EQUIPMENT

of deposited metal will vary to a certain extent with individual welders, it was decided to base the speed of a rod on a definite weight of deposit in a given time.

As it was essential to obtain tests that could be easily compared with results in practice without unnecessary elaboration, the theoretical depositing efficiency, power consumption, efficiency of the welding plant, extra time, cost of current, welding arc and energy in watts were not incorporated in the tests. But an efficiency test was carried out on all the electrodes used, so that, if necessary, a more elaborate form of findings could be presented for those interested more in the theoretical side than the practical increase in production.

The efficiency test consisted in taking three of each type and gauge of electrodes that were employed on the speed tests, removing their coating and weighing the core wire, the total weight of the three selected electrodes being divided by three so as to obtain the average weight of steel in each electrode. The electrodes were then deposited at the makers' recommended currents on suitable bases of steel which had previously been weighed to an accuracy of one gram. The increased weight of plate after welding was then taken after allowance had been made for the weight and length of rod remaining in the holder, as this portion was weighed with the test piece on which it was used.

Stop-Watch Check Made to Ensure Accuracy

Test pieces of mild steel plate were taken of various thicknesses, namely $\frac{1}{4}$ in., $\frac{3}{8}$ in. and $\frac{1}{2}$ in., each piece being slightly in excess of 12 in. long. The plates were weighed to the above accuracy. A large number of pieces were prepared so that fillet and butt welds could be carried out. The fillet welds were made to two standards. One had a reasonable throat thickness such as is common practice in many works and suitable for a large number of ordinary production work. The other had a full throat thickness to comply with British Standard Specification No. 538.

After welding the test pieces were thoroughly cleaned and accurately weighed so as to ascertain the amount of deposited metal. Exact times were taken with a stop-watch of first grade accuracy and the operating currents measured by an external amp meter.

New System Gives Saving Varying from 33—46%

The average percentage saving based on the slowest and fastest times in these tests was 30 per cent. and the highest average percentage 46 per cent., the latter figure applying to the heavier plate. All these figures have been proved by the most careful tests.

In one million feet of weld the average of nine tests shows a saving of 21,712 man-hours with a maximum saving of 51,250 man-hours, again based on one million feet of weld, but without taking into account de-slugging times or electrode efficiency.

After the tests, all the test pieces were carefully examined to ensure that the figures shown in the calculations were only taken from satisfactory welded pieces, but

as the whole of the test pieces proved to be satisfactory, the findings from the tests can be taken as conclusive proof that these results can be obtained by any works who desire to increase their welding production, without having to alter their existing equipment or train operators in an entirely new technique and methods.

In conclusion, we would once again emphasise by the following examples the enormous saving that can be made. Let us suppose that a general fabrication shop has a large contract to carry out involving:

1 million ft. of $\frac{1}{4}$ " plate, fillet weld	normal throat
2 " " " " " " " " " "	thickness
$\frac{1}{2}$ " " " " " " " " " "	butt weld

The percentage saving would be as follows:

On the $\frac{1}{4}$ " plate	32.6%
" " " "	38.7%
" " " "	46%

Assuming that the average wages for a first-class welder are 2/- per hour and that the overheads on labour are 150 per

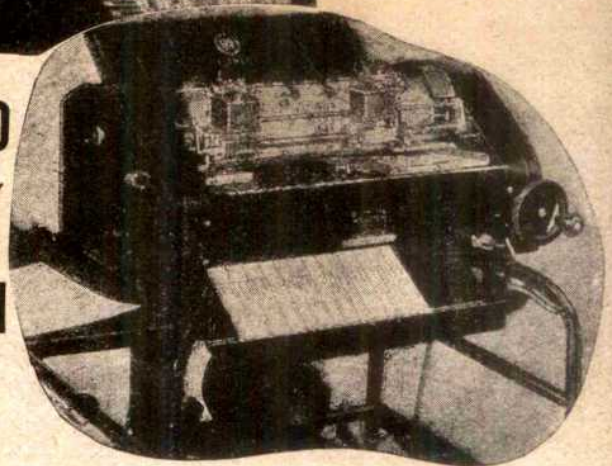
cent., then the saving on the above work alone would represent £16,716, apart from the saving in man-hours and production in a far shorter time. When it is realised that even this figure would be increased in many cases, due to taking into account electrode efficiency, the solution is obviously one that should be adopted by all firms interested in welding fabrication, whether the quantities are large or small, because the savings are still proportionate.

We regret that, owing to a printing error, the price of Ellams M.10 automatic electric duplicators was given in the description published in our Annual Business Equipment Survey (BUSINESS, September, 1941), as 58 guineas. The figures had been transposed and should have read "85 guineas." This price, incidentally, excludes purchase tax.



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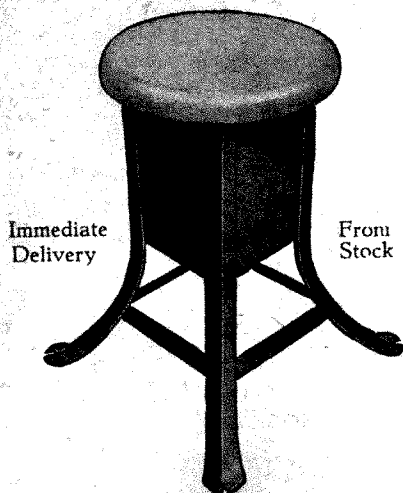
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INDUSTRIAL PRODUCTION EQUIPMENT

15 Points for the Canteen Manager

(Continued from page 26).

caterers. The first method in my opinion is preferable, as the canteen is then operated under the scheme of a general welfare policy and seems to be a practical expression of the firm's interest in the comfort and well-being of its employees. In these circumstances, in certain cases, it is possible to supplement the canteen staff during rush hours, and also when the staff is depleted through sickness, from women employees from the works.

The manager or manageress must have a sound practical knowledge of all the aspects of canteen administration—preferably domestic—science trained or having exceptional cooking abilities.

There Must be a Flexibility of Duties

The popularity of the canteen definitely depends on the atmosphere created by the staff. Good relationship can be fostered or hindered by qualities of leadership.

Duties of canteen staff can scarcely be rigidly fixed, except perhaps for cooks. For example, the duties of the waitresses and service hands should be elastic, as they may be required to assist in washing up and cleaning the kitchen, or similarly kitchen hands may be required to help in the service during peak periods. It is, therefore, important that the staff should be informed when being engaged what is expected of them, and it should be

emphasized that a certain amount of flexibility is necessary to ensure the smooth running of the canteen service.

It is my principle to eliminate inferiority complex and to obviate the idea from the girls' minds that they are merely washers-up, kitchen drudges, or table scrubbers, and to inculcate into them that they are all members of a team whose object is the provision of suitable meals for our workers, which is extremely important work.

A Canteen Staff Can Produce Its Own Uniforms

On the management's part, it is worth while to give consideration to the welfare of the canteen staff in the way of providing protective clothing—overalls and caps. In this direction we obtained the services of a woman who has had many years' experience in dress designing and tailoring and bought a small sewing machine which our maintenance department equipped with electrical power. All uniforms, caps and table covers are made by this woman.

At the outbreak of the present war it occurred to me that it would be a good thing to institute classes at the works for cookery—both practical and theoretical. I arranged, in conjunction with our works continuation school, to give lectures and demonstrations in the theory and practice of cooking during the evening to my staff and also to those of our female staff outside the canteen section.

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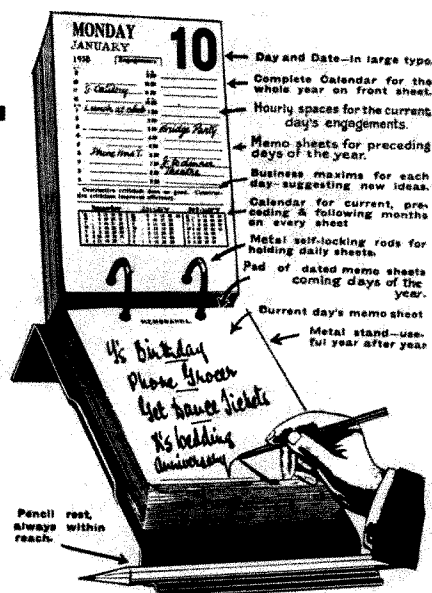
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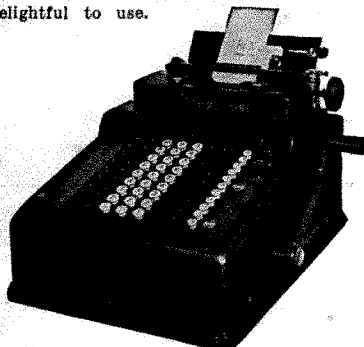
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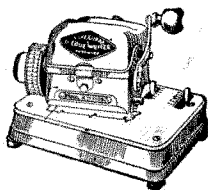
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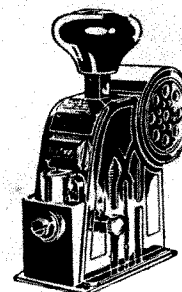
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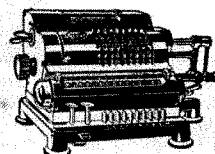
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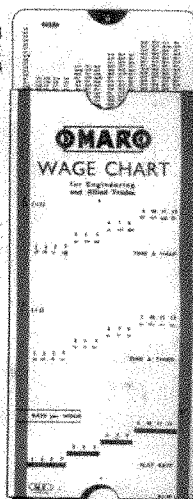
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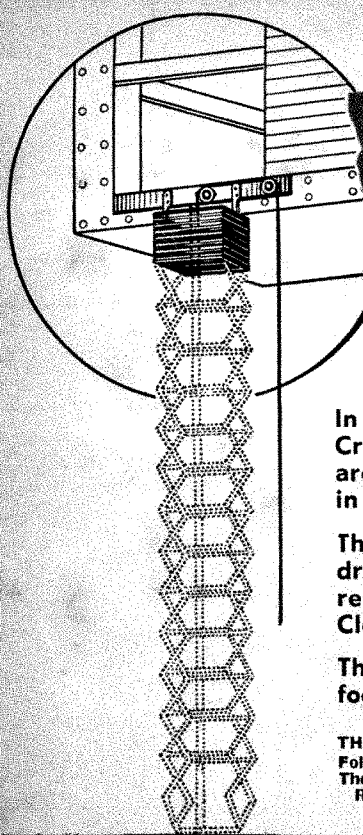
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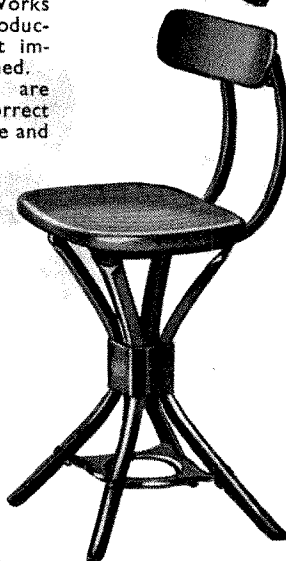
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History Repeating Itself

A personal reminiscence of the Great War of 1914-18

By

THOMAS DIXON

(Managing Director of the Dictaphone Co. Ltd.).

WHEN in August, 1914, Great Britain declared war on Germany, very few people foresaw what was later to prove a very serious embarrassment to business executives and office managers—a serious shortage of office workers.

The difficulty was not felt immediately, not in fact, until the big response began to the appeals issued by the Government that women should play their part in war work. How that appeal was answered is a matter of history, to many of us it is a proud recollection.

As women passed from many different callings into the various forms of war service, a situation developed in which, through shortage of staff, the conduct of office work became more and more difficult. Women clerks, and especially the highly trained shorthand typists, became almost unobtainable, and business correspondence was carried on only with great difficulty and often with serious delay.

History has a way of repeating itself. What happened in the years 1914-18 is happening again today. But just as the rush of women into war work is today on a far greater scale than it was then, so the difficulty caused by their withdrawal from commercial life is certain to be aggravated as time goes on. We were officially told quite recently that the Ministry of Labour wanted another 150,000 women before Christmas; what is going to be the effect of such a withdrawal of labour, much of it from the

classes, already depleted, who help to keep our business offices going day by day?

Already female office labour is at a premium: already, as in the last war, shorthand typists are hard to find and hard to keep. The shortage is increasing weekly: there is every indication that in days not very far ahead it will become acute.

The shortage of office staff during the years 1914-18 gave a tremendous impetus to the adoption of the dictating machine, which in those days, if not exactly a novelty, was far less widely recognised than it is today as an integral part of up-to-date office equipment. Thousands of business men then learned for the first time that the Dictaphone was not just a fad or a "new-fangled idea" but a sound and practical means of handling business correspondence of all kinds, an invaluable help to the busy executive and a very real compensation for the increasing loss of staff. They were, in fact, forced by circumstances to seek "the better way of doing things." They found it in the Dictaphone, and today there are hundreds of Dictaphone users who owe directly to the labour difficulties of the war years their introduction to a method of saving time, work and money, which nothing would now induce them to abandon.

History, as I have said, is repeating itself. What we of the Dictaphone Company saw between 1914 and 1918 we are witnessing again today: the Dictaphone is more and more being brought in to enable

staffs depleted by war demands to carry on efficiently and to handle a volume of work which would otherwise be far beyond their powers.

"Without the Dictaphone we should have to increase our staff" is a tribute with which we of the Dictaphone are very familiar, and it bears a message to those who are not using the Dictaphone today. To them it means simply "You could carry on despite staff shortage if you used the Dictaphone."

That is indeed the fact. Because it saves so much time and so greatly increases individual output, thereby improving personal efficiency to a remarkable degree, the Dictaphone goes far towards solving the staff problem.

History is repeating itself!

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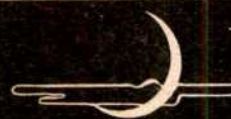
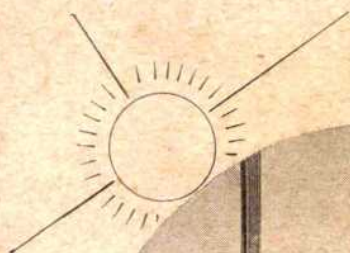
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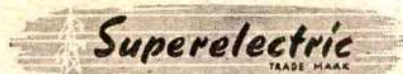
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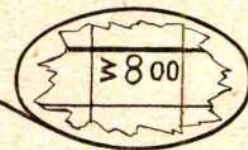
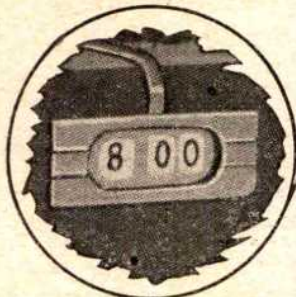
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These Nine Methods Put Our **OUTPUT UP 45%**

IN common with most other firms who had to turn over from normal peace time production to work of national importance we found, at the outbreak of war, that our existing systems would not give us the volume of production demanded by Government departments. This must not be taken that our ordinary organisation was not of the best—it was. We were considered to be one of the leaders in our particular branch of electrical engineering, and no firm could achieve or hold such a position without production methods which could stand up to the most strict competition.

But to convert the whole of our works at very short notice to the production of material very different from that we had made for years did impose a severe strain on the whole of our organisation. It was realised at once that we could only cope with these new conditions by completely re-organising.

We Planned to Give Each Method a Clear Field

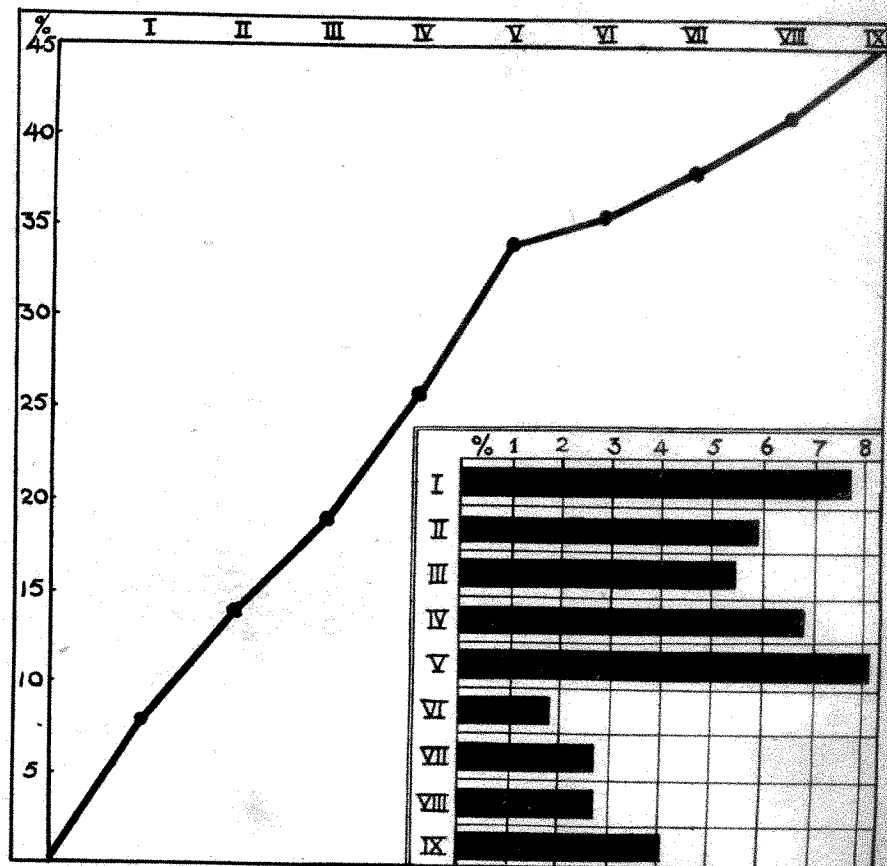
The changes we were compelled to make when we undertook this new work for the Government gave us plenty of opportunities for trying out new methods of speeding up production. We realised, however, that to experiment with a number of different schemes at one time would not give us any hint as to which of these were the most successful. It was, therefore, decided to proceed slowly, trying out only one new method at a time. Each of these was to have a clear field for six to eight weeks, unless it was clearly obvious within a period of about half this time that the new method was a failure.

So far we have tried out nine different methods, and every one of them has been instrumental in stepping-up our output. Over the period of eighteen months which has elapsed since the first system was introduced we have been able to step-up production per labour-unit by 45 per cent. As the following table shows, the earlier methods employed produced a larger increase than the systems tried out later in the plan.

There are two explanations for this.

Determined to Increase the Production of Every Unit of Labour by the Most Congenial Methods Possible, this Firm tried each of the Ideas described at Intervals of Two Months

By the Works Director of a Leading
Electrical Manufacturing Company



The larger of the two graphs above show the accumulative affect of the nine methods used to step up production by 45%. In the smaller graph the varying percentages of success are shown individually. In each graph the Roman figures relate to the following methods used: I. Improved stock control and material chasing; II. Better progress control; III. Improved lighting; IV. Careful selection and grading of workers; V. Improved working conditions; VI. Music at work; VII. Longer rest pauses; VIII. Improved medical services and IX. Strict control of absenteeism

One is that there is a definite limit to the increase which may be obtained from any worker and that the worker responds more easily to the first efforts made to create this step-up, than to those which come when the worker is working almost at his or her peak of production.

The second is that we tried the more obvious methods first and that those systems which came later in the list would, at any time, have given us only a small increase in production. The all-important thing is, however, that every method did produce results.

The methods we tried were the following:

Increase in Output above October, 1939.	
Improved stock-control and material chasing ...	7.65%
Better progress control ...	5.85%
Improved lighting, including local lighting units and more fluorescent tubes ...	5.4%
Careful selection and training of prospective employees ...	6.75%
Improved conditions for employees	8.1%
Music at work ...	1.8%
More rest pauses ...	2.7%
Improved medical services and conditions ...	2.7%
Strict control of absenteeism ...	4.05%

It can, of course, be argued that these figures prove nothing beyond the fact that they each resulted in an increase of output and that had they been tried out in a different order the

figures would have been vastly different. That may be so, but the all-important point is that every single method resulted in a step-up in production, which was what we were aiming at.

Peace-time Storage System Was Useless for War Conditions

In peace-time our factory was planned so that there was a steady flow of material in at one end and the removal of finished product at the other to a number of warehouses all located at distances from five to ten miles from the main factory. Materials arrived regularly and there was very little trouble due to shortages of essential raw materials. We began to feel the pinch resulting from various materials being in temporary short supply very early in the war and, for this reason, we coupled our desire to step-up production with a system which would, we hoped, ensure a fairly even flow of essential material to the factory.

Provincial Sales Staff Used to Chase Materials

We had a number of branch sales offices in various parts of the country and, of course, with nothing—or very little—to sell these immediately became redundant. In the autumn of 1939, however, there was not the urgent call

for man-power that has since arisen. The directors of the firm decided to retain all employees rather than turn them out into a labour market that was already flooded with thousands of others who had lost their jobs through the slump which came in with the war.

So, these salesmen scattered around the country were put to work in helping the manufacturing side get their requirements. They were extremely successful and we can claim a lower figure for hold-ups owing to shortage of raw material than most other firms producing similar products to our own.

Local Stock Rooms Proved More Successful Than a Central One

With the assurance of a constant flow of material into the factory, the next problem was to readjust our production lines to meet the demands of the new type of product we were making. Our old lines had to be completely rearranged and with this re-planning the former stock-rooms were found to be unsuitably placed. Every inch of factory space was valuable and it was decided, therefore, to remove the main stockroom right out of the factory and to carry only enough stock inside to cover two days' production.

A large house, nearby, was converted into the reception stock-room and regular deliveries were made from this to the series of distributive stock-rooms established adjacent to each of the new production lines. By restricting the number of parts carried in these stock-rooms to the requirements of the single line they each served, it was found that the time taken to draw stock and move it to its required spot on the production line was reduced by over 60 per cent., while the constant check on the full stock of each separate part or quantity of raw material enabled the stock "chasers" in the provinces to be advised in ample time when they were required to speed up any of our suppliers.

New Progress Control Method Proves Effective

At the end of six weeks the check we made showed that the net increase in production during the period was 7.65 per cent. for every labour unit. So, we decided to retain these two schemes and proceed with the next method on our list. This was an improved system of progress control — and naturally followed on the change-over in production methods that had been forced upon us. There is not the space here to describe this in detail, but it will be sufficient to say that with this new control we were able to abolish all the bottlenecks which had crept in since the outbreak of war, and it actually stepped-up production by another 5.85 per cent.

With the replanning of our production lines it was found that much of the extensive lighting installation which

MINISTRY OF LABOUR AND NATIONAL SERVICE.

ST JAMES'S SQUARE,

LONDON, S. W. 1.

31st October, 1941.

To the Readers of BUSINESS.

The full utilisation of our man-power, including the employment of women, is a prime necessity. Skilled workers are so valuable that to misuse their skill, or to keep it inadequately employed, is an extravagance we cannot afford.

Not in the light of our peace time standards and requirements should we view our undertakings but in the light of their place in the great machine upon which the Government is dependent for the wherewithal to continue its struggle for life and victory.

Above all we need to remember that EFFICIENCY is dependent upon understanding, that understanding is based upon knowledge and, therefore, that perfect co-operation which will give us the increased output we need, calls for the dissemination of knowledge over the whole field of our endeavours.

Yours sincerely,

Geoff Goulburn

Parliamentary Secretary, Ministry
of Labour and National Service.

had served us well in pre-war days was very badly placed. Rather than scrap the existing wiring and equipment, of which there was already a certain shortage, we decided to adapt the wiring to our current needs. In place of many of the overhead lamps, which incidentally had given every worker in our factory at least 15 foot-candles of illumination in peace time, we introduced a number of local light units which actually increased the standard of foot-candles to 17 or 18 in many cases.

Fluorescent Tubes Improve Factory Lighting Conditions

In other parts of the factory we introduced the then brand new fluorescent tubes, which provided almost shadowless lighting throughout the area they illuminated. Beyond the cost of installation of the local lights and of the fluorescent tubes we were not involved in any extra cost for new equipment, and we have our old complete wiring system to revert to when we are permitted to return to ordinary peace-time production. Within two months of the introduction of the new lighting our output had increased by a further 5.4 per cent. bringing it to 18.9 above the figure for October, 1939.

We then proceeded with a scheme for the better selection and grading of the new workers we were compelled to take on to cope with the Government contracts we had received. For many years we had put every prospective employee through a stringent set of tests, to decide his or her ability for various types of work in our factory.

"Psychological" Grading of Workers Proves its Worth

Apart from a general intelligence test we conducted a number of tests popularly called "psychological examinations." These had proved extremely successful in grading applicants and very rarely indeed had the results of tests misguided us as to the abilities of a worker. War-time conditions, however, did not permit us to be so rigid in our demands. It was obvious that we could not refuse employment to many women who could not possibly have passed our stringent tests before the war.

A modified series of examinations were, therefore, devised and with these we were able to sort out all new workers and place them on work for which their intelligence and ability showed them to be most suitable. To gauge the value of these tests a certain percentage of newcomers were not called upon to pass these grading tests until two months after they had started work for us. A comparison of output of graded and ungraded workers showed that the former were turning out 6.75 per cent. more work than the others.

With the influx of many hundreds of new workers, our existing staff welfare arrangements had to be replanned. A careful check was kept at every step and the workers themselves were questioned as to their views on the new welfare amenities we provided. The canteen was replanned, since many of our new workers were having to travel considerable distances to the factory, while, of course, war production had involved longer hours and created a demand for extra meals.

Several other revolutionary ideas were tried out and met with an eager response from practically all the workers. The final innovation was to arrange for special buses to wait at the factory gates to help the workers on their homeward journeys. These buses linked up with regular bus and railway services and proved to be extremely popular with all who used them. Our check on output increase at the end of two-months trial showed that once more there had been an increase—this time the largest individual increase in the whole series, 8.1 per cent.

How We Overcome Objections to Music at Work

By this time our production was nearly 35 per cent. per labour unit above the figure for October, 1939, and we had still four more methods to try out. We decided next to introduce the "Music while you work" programmes. These met with a mixed reception, on the whole favourable, and we rearranged the work of certain members of the staff so that their objections to the "noise," as they termed it, were overcome by placing them in departments where the broadcasts were not relayed. Our check on production increase in this case showed only 1.8 per cent. But it was obviously paying us and pleasing many workers, so we have retained it.

Longer Rest Pauses Lead to Further Increases

For many years it has been the policy of the firm to give two rest pauses of ten minutes each, one at 10.15 a.m. and the other at 2.45 p.m. It was realised that these breaks were inadequate when long hours of overtime had to be worked. Accordingly we introduced two more breaks of the same length and moved the original afternoon break forward to 2.30 p.m. A second afternoon break at 4 p.m. was given and a further one at 6.30 p.m. A careful watch was maintained on all sections of the factory for three weeks after these extra breaks started and it was seen that there was an amazing jump in individual effort after each of the afternoon pauses and again with the evening one. Our two months' check revealed that in the aggregate the pauses gave us a further step-up of 2.7 per cent.

A similar increase was forthcoming as the result of the eighth of our methods. We had always prided our-

selves on the medical care we provided for our employees, but, once more, we realised that we could help our workers even more to meet the unusual conditions resulting from the war. In consultation with our works M.O. we decided to introduce a works solarium, in which any of our workers could, in the firm's time, have artificial sun-ray treatment.

Sunray Treatment Reduces Absences from Colds

This innovation coincided with the early spring, when colds are particularly prevalent. It cut absences from illness from our average of .68 days per worker per month (8.16 days per annum) to under .3 days per month during the period of the year when the highest figures for absence from colds, etc., are normally to be expected. This avoidance of absentees in substantial numbers was naturally reflected in our output figures, which once more showed an increase, as mentioned above, of 2.7 per cent.

At the time we were concluding the eighth test, absenteeism reared its ugly head very prominently and, in common with most other firms, we decided to take active steps to fight it. We considered that we were doing all we possibly could to give our workers a square deal and that the wilful absenteeism which existed must, therefore, be dealt with without kid gloves. We reported five persistent and deliberate absentees to the local labour exchange and they were all warned that they would next be summoned in a Police Court unless they were regular in their attendance at the factory.

Absenteeism Cannot Be Handled In Kid Gloves

At that time we had an absentee figure of over 9.5 per cent. but the threats made by the official of the Labour Exchange were publicised and had the desired effect, not only on the five men concerned but also on all the others. Our absentee figure dropped to under five per cent. in three weeks and has remained in this region ever since. Once again the effect was to be seen on our production chart which showed a further increase of 4.05 per cent. bringing up the total increase to exactly 45 per cent. above that of eighteen months before, when we had started our experiments.

For the time being we are resting. It is not impossible that we can provide other incentive for our workers to increase their individual efforts still further, which, since they are largely paid on a piece-work basis, automatically provides them with financial reward for their extra industry. Whether we shall find this new incentive remains to be seen, but we have proved to our own satisfaction that production can be stepped-up to a figure considerably beyond that asked of industry by Mr. Bevin.

MANAGEMENT in War-time . . .



FOLLOWING their policy of offering readers topical and useful information on the most vital industrial problems of the moment, the Editors of *BUSINESS* decided to devote the bulk of this issue to the urgent need for increase in output. The need for this big step-up in production, stressed by the Minister of Labour a fortnight ago, found many firms unable to speed up their work, although their output was admittedly substantially below the standard of other firms.

That there is no single solution is obvious to all. This issue of *BUSINESS* alone contains over thirty different ideas by which production charts may show an upward curve. Pressure on space alone prevents us from describing many more.

The high rate of increase set by Mr. Bevin will strain the resources of many industries but, as we show this month, *it can be done!* *BUSINESS* is already conducting another nation-wide investigation, this time into the most successful methods for achieving Mr. Bevin's aim. The results of this survey will be published in the December issue. Any firms interested in this subject, who do not receive a questionnaire form, can obtain details of the work of this survey on application to the Editor. For obvious reasons we confine our investigations to a typical cross-section of industry and some firms whose views and statements might prove of interest, must necessarily be omitted from the list.

MANAGEMENTS MUST GIVE THE LEAD

OF all the campaigns started by Government Departments since the outbreak of war none have gripped the public imagination so much as Lord Beaverbrook's spirited call for 100,000 tons of waste paper. Statistics from all parts of the country show the

splendid response that has been immediately forthcoming. But there is still much to be done.

Industry, itself, is one of the biggest offenders in the hoarding of useless paper in various forms. Every firm has its own files of old records, correspondence and printed matter serving no useful purpose and only gathering dust in a corner. Every scrap of this paper could be turned to some good purpose now.

The usual excuse for lethargy in this matter is that the man who would willingly turn out this old paper has not the authority to dispose of it. The decision to clear the shelves and store-rooms must come from the top. It is, therefore, the duty of every management to see that instructions or permission to comply with the "Beaver's" appeal are given at once. An example of this type has a much more far-reaching effect on subordinates than many other and more obvious "national efforts." A clear indication that the management itself is willing to do everything it can to help inspires most workers with a genuine will to get on with the war.

WOMEN WERE DOING MORE IN THE LAST WAR

SOME readers regard us as rather critical as to the speed and success with which women are being trained for war work. I find, however, that a critical attitude is justified.

Looking up some records of production in the last war we find the following—"Contracts for shells will only be renewed, after March 31 next (1917) with those firms who employ 80% of female labour on shells of size from 2.75 ins. to 4.5 ins. inclusive. On higher sizes of shells contracts will only be renewed if the Ministry of Munitions' instructions have been carried out not only in regard to the proportion of women to be employed in each factory, but to the proportion of skilled and semi-skilled men."

That notice was issued within 2½

years of the commencement of the war. Are we so far advanced or anything like it in the arms industry to-day?

If any evidence were required as to the potentialities of women on munition work, these words provide it.

By around the same date, 950,000 women were at work on jobs ranging from the heaviest labour and unskilled operations to the highest grade of tool room work. They were building guns, including fine work on the breech mechanism and the cutting of large screw threads up to the shoulder. They were doing most of the work in some shops on 3½ ton army lorries, including chassis erection and inspection. They were turning connecting rods, propeller shafts on liners and in some cases doing practically all the drilling. In some aero-engine shops, women were doing the greater part of the turning of central lathes of half-thousandth, milling webs of clerget on a Becker miller without stops and setting up their own jobs. They were making tools and gauges of all kinds to fine limits.

So we have still a long way to go, to beat the records of management in the use of women for war material production in the last war.

WHY NOT A "YORK SCHEME" FOR BRITAIN?

YORK is a city of 57,000 inhabitants in Pennsylvania, but it contains no single plant of enormous dimensions. So it had difficulty in getting its share of direct war contracts.

But the chiefs of York's group of individual engineering plants were men of imagination. They decided to group themselves together, for the purpose of applying for war contracts. If one manufacturer had not enough lathes and presses and drills to swing a direct contract two or three or a dozen other manufacturers in the town could supply the needed tools and share the contract as sub-contractors.

Over a year ago its local manufacturers put W. Shipley, chairman of the York Ice Machinery Corporation, at the head of their project. Under this scheme the manufacturers of York were able to tender as a single organisation for war contracts at Washington. In the first year this method of co-operation, of pooling plant, organisation facilities and expert personnel has brought the town contracts valued at £32,500,000.

More important still, it has shown the small manufacturers in many other towns how to get their share of the war business. Something in this way could still be done in many of our own smaller industrial centres. This is an idea that some of our younger manufacturers must wish they had thought of!

The New Official in the Western Electric Works is THE PERSONNEL ADVISER

LAST month we saw how Western Electric developed an entirely new system of interviewing employees as a result of their twelve years research. The report * we are considering gives something like 120 pages of a study of the defects in even this improved technique. This study is based wholly on the work of psycho-analysts, psycho-pathologists and psychiatrists.

In other words, the complaints made in interviews had to be studied in terms of the personal background of the worker, of the situation in the shop where he worked, and in terms of his own psychological make-up. We will not weary the reader with the absorbing record of the company's experiments in this direction. But the following little table gives just one instance of how what the worker wants to say is influenced by his own position, and how the personal relationship is changed into a complaint and general grievance.

This is How the Distorted Personal Factor is Overcome

Suppose that A & B are doing jobs which A regards as similar. Then A may complain in the following ways (he thinks) B is earning more money than he is:

Relation of A to B

A has less service than B.

A has more service than B.
A is a man: B is a woman.
A is a woman: B is a man.

A is single: B is married.

A is married: B is single.

A has less education than B.

A has more education than B.
A is, or thinks he may be, less efficient than B.
A is, or thinks he is, more efficient than B.

Obviously, the actual facts are distorted by the personal equation in every case. But the fact remains that scarcely an employee can be interviewed who is not subject to this personal equation. Yet if the valuable evidence acquired at the 10,300 interviews with employees was to be made useful these reports must be free of

In this article, the third of the series, describing the Hawthorne Investigations at the Western Electric factory, the methods used to interpret the real cause of employees' complaints and to settle these grouses, are described.

By CECIL CHISHOLM

the distorted personal factor. It was found that, a certain number of workers get one grievance against a particular foreman or charge hand so very emphasised in their minds that it becomes an obsession. Worker after worker was found to have a grudge against entire company and its methods of management simply because one foreman or charge hand had got on his nerves. Often the offender had treated

light on the difficulty which everybody has in telling the truth objectively. The difficulty is not due to such simple cause as a personal relationship, but to a genuine inability to look at oneself clearly. How many highly educated people are capable of talking objectively for one minute about themselves or their surroundings, far less their competitors or enemies? Scarcely any. Eventually the reader interested in this subject is referred to the complete report. But the scheme used for interpreting complaints and reduced output is worth reproducing. It shows the main causes affecting the form in which a complaint is expressed and also the influences which interfere with enthusiasm for the work and the company. The Hawthorne investigators' conclusions were as follows:

Complaints are Usually Found to Have More than One Cause

However, one of the main sources of a low output was a particular occupation with either the situation at home or the social situation in the works. The perfect instance of the first occurred in the case of operator M5 in the Relay Assembly Test. The output of this operator falls roughly into four phases, reflecting closely her pre-occupation with her personal affairs shown in the table at the top of page 12.

But the social situation in the works, the relationship of the worker to his own group, of his own group to the group above it, were found to have far reaching effects on output. Eventually, the researchers came to certain important conclusions as a result of their intensive and scientific study of the 10,300 interviews.

(a) Very seldom is a serious employee complaint due to one cause alone.

A complains by saying:

Earnings are not commensurate with job.

Service is not being rewarded.

Woman's place is in the home.

Woman are being discriminated against.

Married employees are given preference over single employees.

Home responsibilities should be taken into account by the company.

The company attaches too much importance to education.

Brains don't count.

Piece rates are too low.

Ability is not rewarded.

the man quite normally in many instances. But the vexation had been established in the mind of the worker and nothing the foreman or charge hand could have done would have removed it.

But frank discussion with a third party sometimes did. Where this was unsuccessful it was known that it would be advisable to move the worker to another section.

A Method for Interpreting Complaints and Reduced Output

The researches also throw further

* "Management and the Worker." By E. J. Roethlisberger and William J. Dickson (Harvard University Press, U.S.A.). Both the Management Library and the Institute of Industrial Psychology have a copy available for loan to members, otherwise the book must be obtained direct from the American publishers. Ed.

Personal Preoccupation and Variations in Output, Operator M5.

Length of Phase.	Personal Preoccupations and Events.	Variations in Output.
Phase 1 (from October 22, 1928, to end January, 1929)	Operator M5 nursed a great resentment against strong parental control and her inability to live as other girls do, the general effect of which takes the form of complaining frequently about a headache	Operator M5's output is characterised by pronounced irregularity and a failure to keep pace with her fellow workers.
Phase 2 (from end January—mid-July, 1929)	She begins to express more freely her pre-occupations about her home to the older women in the group, who listen to her troubles and give her motherly advice.	Her output commences to rise and is less irregular
Phase 3 (from mid-July—end November, 1929)	She finally comes to the decision to live away from home and takes an apartment with a girl friend	Her output steadies significantly and remains at a high level
Phase 4 (from end November, 1929, onwards)	Because of her mother's illness, she is forced to return home and help take care of her mother	Her output starts to decline and develops its former irregularity

Usually it reflects the general effect of complex situation.

- (b) The analysis of such a situation requires an understanding of the nature of the equilibrium or disequilibrium and the nature of the interference.
- (c) The interferences which occur in industry may be due to changes in the physical environment in the shop (new machine, new job); to changes in the social environment at work (new colleagues) and the resulting conditions which issue from such interferences may be organic (changes in the blood stream) or mental (obsessive pre-occupations which make it difficult to concentrate on the work) or both.

How the Inter-relation of Factors is Analysed

The general terms used in labour relation work such as "fatigue", "monotony", "supervision" do not discriminate among the different kinds of interferences involved let alone among the different kinds of unbalance resulting. If the different interferences and different types of unbalance are not the same ill in every instance they are not susceptible to the same kind of remedy.

For purposes of convenience the interviewers used a rough and ready lay-out of the forces at work (reproduced here).

This scheme at once does away with the simple cause and effect analysis of human situations, substituting the idea of the inter-relation of effects in mutual dependence, i.e. equilibrium. As a result no serious change in one of the factors (interference or constraint) brings about changes in the other factors resulting in a temporary state of unbalance until either the former equilibrium is restored or a new equilibrium is established.

The lines joining up the boxes in the diagram prove the futility of determining what is cause and what is effect.

The authors of this report give the instance of operator M5 cited above. Which of the following factors is cause and which is effect they ask:

- (a) Situation at home?
(b) The nature of her social relations

with fellow workers and supervisor?

- (c) Preoccupations of futility?
(d) Frequent complaints about headaches?
(e) Irregular and low output?

Five Conclusions Show the Links Between Causes of Complaints

From the situation at the Hawthorne plant, investigators were able to draw some extremely useful conclusions.

- (1) The interferences which occur among the workers at Hawthorne and which diminish their capacity to attend to work are not usually confined to the physical conditions of work. Therefore, physiological or muscular fatigue is uncommon (see relations G, C, D, A and B in the diagram).
- (2) Although in the case of some employees the constraint of interference can be traced to factors in their personal history, that type of mental unbalance which has been studied by psychopathologists and ordinarily referred to as psychoneurosis is also infrequent. (See relations F, E, D, A and B in diagram).
- (3) A very common form of induced unbalance in the worker which diminishes his capacity to work effectively can best be understood in terms in which (a) capacity to work, or to fix and sustain attention, is to be regarded as a product of the personal equilibrium of the worker with the socioreality about him (see relations I, H, E and D in diagram); and (b) any circumstance adversely affecting this personal equilibrium is likely to reveal itself in a reduced capacity for active work, in obsessive reveries, and in irrational responses (see relations E, D, A and B in diagram).
- (4) Workers whose personal unbalance is due to factors in their personal history (F) or social situation (I) are less capable of standing any pressure at work (overtime, repetitive work, indifferent methods of supervision, etc.) (see G and H)

than those workers who have more satisfactory personal or social situations.

- (5) Where the social conditions of work are such as to make it difficult for a person to identify himself or his task with any social function (see H), the worker is also liable to obsessive responses and hence to a diminished capacity for work.

Control of Personnel Relationship is Teachable

Notice that this simple diagram gives a basis for analysing any normal dissatisfaction felt by the worker. In brief, the vital discovery of the twelve years research into personnel problems at the Hawthorne Works was just this—management requires in its organisation an *explicit skill* in the diagnosing of human situations. Many a personnel manager, many a welfare worker, sometimes a manager or foreman has an *implicit* and *intuitive* skill in handling human problems. Every successful administrator has a flair in this direction.

But in a great concern such skill must be found where it is wanted, in every personnel official. Therefore it must be teachable. As a result of these experiments, Western Electric has a method of controlling personnel relationships which it believes is teachable.

The Field of Duties of the Personnel Adviser

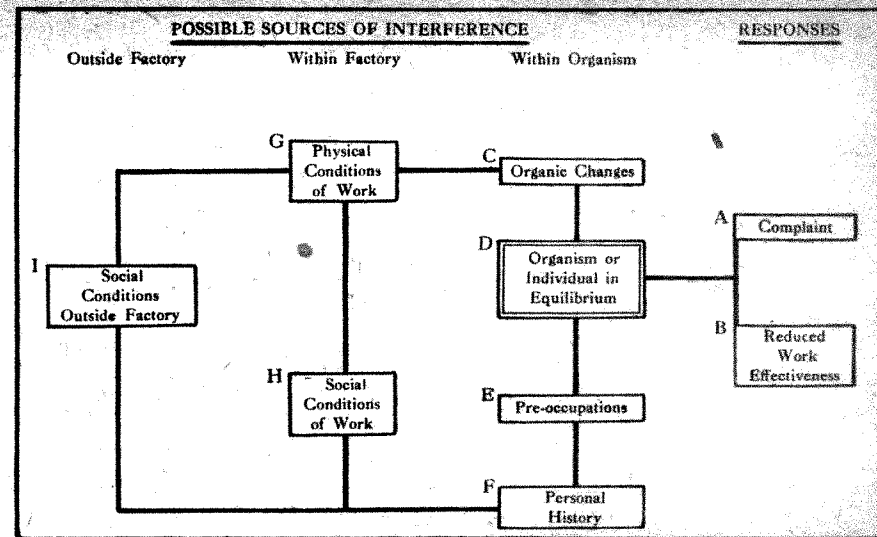
The new technique involves the appointment of a new type of officer—the personnel adviser. Every adviser is responsible for a group of around 300 workers. He, or she, uses the interview method outlined last month. The personnel adviser has no authority over the worker, nor does he make suggestions as to changes in conduct.

What he does do is to interview each member of his own group at least once a year. When it is observed by a foreman or fellow workers that some worker is thoroughly upset, the per-

sonnel adviser takes up the matter with the worker in a special interview (the time for which is paid by the company). The solution of the problem may require the co-operation of the foreman. This the adviser secures, presenting to him clearly the real difficulties of the worker.

The Personnel Adviser is in the Same Position as a Doctor

It is found in practice that the greatest amount of dissatisfaction occurs in a factory when a change is made in process, when the workers are moved from one shop to another, when methods of payment or discipline are changed, when a new foreman or charge hand is appointed. From his unique position, it is found that the personnel adviser can often ease all these situations because he knows each of the personalities involved so well. Thus he can ease the difficulties of the new foreman by telling him about the people he is working with, about the methods of the last foreman that were successful. Where a number of people are moved from one shop to another, he is easy of access, is able to explain difficulties to the newcomers,



This chart helped the Hawthorne investigators to analyse the inter-relation between the various basic causes of complaints

to accustom the old foreman or charge hand to the new people, to explain the devices used against any discomforts or inconveniences such as dust, high temperature, etc.

The relationship of the personnel counsellor to the worker is, in a modified degree, that of doctor to patient. Anything the worker tells the coun-

sellor is told him in strict confidence. That confidence is invariably respected. Results have proved that the use of specially trained people to study and ease the worker's social problems within or without the works has reduced unrest and improved labour relations and incidentally output.

(To be continued).

The War-time Functions of an Employment Department

A New Understanding of Workers and Working Conditions is now Necessary

By R. S. C. BERESFORD,
Employment Manager, Frigidaire Ltd.*

THE main function of the employment department is to provide the company concerned with the necessary labour to maintain efficient production. That function continues in wartime, with this big difference—the Ministry of Labour and National Service is the arbiter where and what a person shall do, and the Employment Department becomes the intermediary between the Ministry and the Factory, both in the engagement and the leaving of an employee.

The basic problem today, which is at the root of all those incidents which lead to disputes and arguments, whether individually or collectively, is that the worker considers war work to be for the duration only, and that when peace is declared the pay off will be

even faster than wartime absorption. Under such conditions it is extremely difficult to engender loyalty, which is the intangible but concrete asset for all enterprises, but which takes time to grow. The Essential Works Order provides machinery to create the stability necessary for this growth and the scheme lacks only the essential publicity which would prevent the feeling of resentment which the application of the Order now arouses.

Every Job Must Be Examined and Broken Down

One of the characteristics of a war-time employment department is that it now takes even more time and trouble for an employee to leave than it does for someone to be found and started in work.

The finding and starting of workers is to-day entirely different from the normal; no longer may we take what steps we like to secure labour, we may apply only through the Labour Exchange and we take what we can get.

Every job has to be examined and the executives concerned must decide where jobs can be broken down, so that the maximum use is made of every minute of the time of a skilled employee, and work which a lower grade worker can do is apportioned accordingly. Often this means that three persons will be required to do what was done by two persons before, but whereas the two persons were fully skilled, we now have only one skilled, one semi-skilled and a learner.

"Green" Labour Demands New Methods of Tuition

Training is another new function of the employment department, which has become essential for successful operation. We have found that it is not a successful policy to introduce "green" labour to the factory floor. An initial training period is necessary for three purposes. First and most important to enable the employer to sort out those workers who are really suitable for the type of factory they will work in. Many "green" workers for instance genuinely want to do factory work, and are convinced they would like factory work, but are nevertheless more suited to some work other than light engineering. Secondly, "green" labour has to be

*From a Paper read at the Annual Conference of the Industrial Welfare Society at Reading.

educated to the new environment into which it has entered. It is not always realised that, to the uninitiated, a factory is a strange new world of its own. A friendly atmosphere, clean and pleasant surroundings, even a little informality, will work wonders. Clocking systems, incentive bonus schemes, discipline and orderliness have to be demonstrated and explained. The welfare facilities must be competently and thoroughly outlined.

Finally, there is the training for the job itself. We consider this to be the second stage in a training curriculum. The first stage covers broadly observation, selection and education. When the first stage is completed, the type of work required to be done will determine whether training for the job is done at our training centre or on the factory floor.

Special Problems Connected With the Introduction of Women

One problem which will loom more and more largely very shortly is the disparity between the rates paid to women who do women's work and those who are displacing men. Since the influx of women displacing men is only a fairly recent occurrence, the initial 32 weeks' probationary period is not yet completed in most factories concerned, but when it is, there will be some real heartburnings.

The shopping problem has not troubled us greatly because we let our female employees leave at 5 o'clock on Fridays, the mid-day meal break is from 11.45 to 12.45, and we have a good shopping centre within a few minutes. Nevertheless we suspect that some of our absenteeism and lateness, which are not unduly large, might be due to shopping difficulties.

All female employees have to be passed by our works doctor while they are in the first training stage. Eyesight and teeth are not good generally and there is a general tendency to anaemia. We now have a sun-ray lamp, the use of which will be prescribed by our works doctor and we expect to get beneficial results. Free anti-catarth injections were given last winter to men and women and we are resuming this service now, owing to numerous requests which testify to its value.

A Good Cure for Absenteeism and Unexplained Illness

Owing to the requirement of the Essential Works Order that if a man leaves a complete record of his absences in the preceding two months must be given, we now keep a comprehensive card index of absences. On the second day of unexplained absence a very nice letter is sent, explaining what may be the result of continued wilful absence under the Order. On the fifth day we send a rather terser letter; on the eighth day we propose to report the matter to the National Service Officer. This usually works.

How to pay Workers during Breakdowns and Hold-ups

These Wage Payment Methods have Proved Effective in Action

A READER of BUSINESS, the works director of a prominent Midlands engineering company, put this poser up to the BUSINESS Service Bureau early this month:

"How do you pay men or women stopped on his (or her) own piece work job owing to shortage of materials, machine break-down, lack of power, etc. and put on another job at time rates? The operator working to a given piece rate is never satisfied with mere time rates."

With the introduction of the Essential Work (General Provisions) Order, 1941, a definite legal ruling was given to solve this problem, but obviously what our inquirer wanted was a solution that aimed at giving the worker concerned a rate of pay over which he could not grouse. He wanted, in fact, to carry on from where the Essential Work Order left off, which is actually very early on in giving a piece-rate worker a satisfactory rate of pay if work on his own job has to stop.

The Legal Basic Wage is Liable to Cause Discontent

The legal position is, of course, that a worker is now entitled to receive a minimum daily rate at time-rate irrespective of what he may have been able to earn at piece-rates. In order to qualify for this guaranteed wage, the worker must be willing to perform any services outside his usual occupation, which, in the circumstances, he can reasonably be asked to perform during the period when work is not available for him in his usual occupation in the factory. Failure to comply with orders given by the factory manager can involve immediate dismissal and report to the Ministry of Labour and National Service.

While this is a vast improvement on the position as it was before the E.W. Order was introduced, it still leaves a wide gap between what a man can earn at piece-rates and what he will receive at a guaranteed basic time-rate. And this has led to considerable discontent in many cases.

There are a number of firms in the engineering and allied trades, however, who have sought to overcome these grounds for discontent. They have introduced systems which go far to keep the workers in a contented frame of mind when they have to undertake other jobs.

One firm, by careful time study, has assessed the average piece-rate for

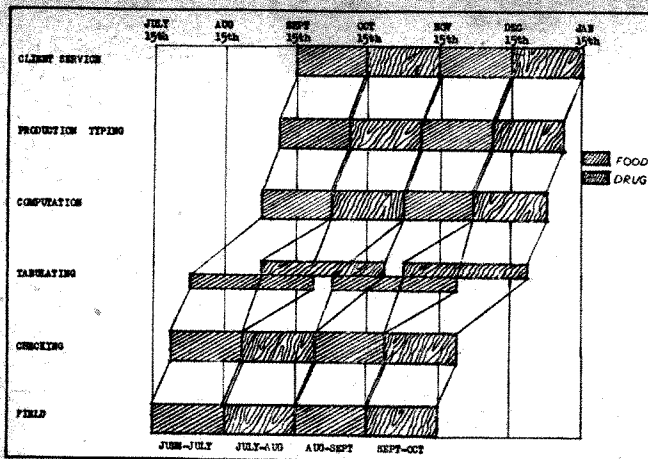
every job in its factory, even though it is paid at a time-rate. When a regular piece-rate worker has to be transferred temporarily to another job, his output on the new work is watched and if satisfactory he is paid rate equivalent to that which was earned by a worker when fully employed on this job over three months. By adopting this method of adjusting payment it has been found that workers who are normally in receipt of a good wage do not object to doing some comparatively unimportant job which might otherwise cause them dissatisfaction.

A Bonus Distribution Keeps Workers Sweet

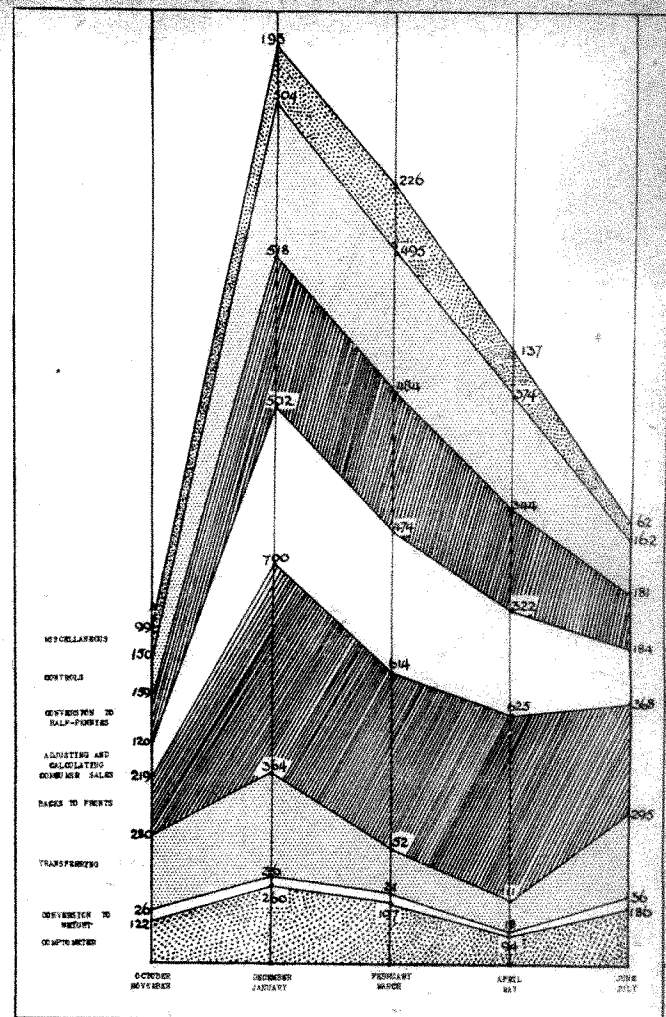
Another concern fixes a definite labour figure for every contract. If the contract is concluded at a labour figure lower than that estimated, the balance is distributed among the workers on the job in ratio to their average earnings on the job. If, for any reason, work on one contract is stopped, the workers are immediately switched to another contract, but do not benefit in any distribution which may be made at the end of the work on the second contract. Similarly, men temporarily drafted to help men on the first contract would not benefit in the final distribution on that work. This little method of give and take meets with the approval of all workers and has proved vastly more successful in operation than a short test with the guaranteed basic time-rate.

We have only space to quote one other example here. A London engineering firm overcame the problem by paying any man, finding himself in the position described in the question, his normal day-rate plus one-third, which is normally slightly below what would have been earned at full piece-work rates. This system has been used by the same firm when, at the commencement of a new job, it is impossible to fix piece-work rates. Here again they pay an average hourly rate greater than in the normal time-rate but still rather less than can be ultimately earned when piece-work rates are finally fixed.

As one firm tells us, in times of war, labour discontent must be avoided at all costs and if, for any reason, an operator who normally earns a good wage at piece-rates is prevented from doing so through no fault of his own, he should not be penalised.



These two charts have a great influence on new, inexperienced girls. That on the right shows them their volume of mistakes, while the chart above gives them an idea of their place in the complete job



Six Methods that Paid in

Organising New Office Workers

by a Woman Office Executive*

EVERY war factory in the country is faced with the problem of quickly organising new offices. Too often this means putting raw staff before delicate new machines, such as power-driven calculators, automatic punching and sorting machines, tabulators and electric typewriters.

The first difficulty is psychological. The girls are, at first, frightened by the strangeness of the work, by the vast volume of figures they are asked to handle. I have found a simple method for overcoming this first snag.

In putting a new girl to work in any of our departments, we never set her before a complete day's work. Instead, we give her a couple of hours' work; then a second short job and so on. We are always careful to explain to new girls that they must not be worried by the fact that they are not able to fit in their job with the main scheme.

We do not anticipate that the girl

will come up to enquire about her work before six or eight weeks. In other words, it takes her this time to master her job and feel at home. After that, I should be disappointed if she did not come up to enquire about the nature of her work. Very often a girl will say, "Can I go through the tabulating department one afternoon if I finish my work early?" If a girl cannot be worked up to this amount of interest in her job, her speed and percentage of errors are bound to be bad. Either she is below the average or her supervisor has not won her sympathy.

The next trouble is speed. The new girl has great difficulty in realising that there is any urgency about her work. Urgency is the last thing which our girls' schools teach.

In our particular business each job takes almost exactly sixty days to go through. We therefore allow around the same time for the statistical recording, which is exceptionally thorough. By putting up on the walls

of each room a simple chart in colour, showing exactly how the job goes through from the first stage to the last, we are able to get the idea of urgency quickly home to even raw new hands. This is essential if reasonable time is to be achieved from untrained office staff.

This is How to Impress Importance of the Job

Curiously enough, it is my experience that an explanation of urgency given a girl as I stand by her desk or in my own room is not listened to. But if the same explanation be given to a caller whom I am taking round the offices not one but three or four of the girls concerned will drink in every word. I find this indirect method one of the best for getting the idea of a schedule's urgency into young heads.

We are always careful to explain to the new girls that they must not be worried at first by the fact that they

*Executive concerned is a college graduate with some psychological training which, it will be observed, is applied in the methods outlined above.

are not able to fit in their job with the main scheme of the work. Few large employers realise that this is one of the prime causes of girls throwing up new jobs. A woman requires a personal note in her job more than a man. She cannot be easily interested in the abstract nature of her job or the perfection of the machine she is using. But if she knows that her work is tied up with Miss Brown, Miss Smith and Miss Robinson, that they are dependant on her and she on them, her whole attitude will change. Particularly if it is seen to that she meets Miss Brown, Miss Smith and Miss Robinson on friendly terms.

Every Worker is Given an Individual Time-sheet

There are minor difficulties however. The three major problems tend to develop after a few weeks' work.

- (a) Not only the girls, but some junior executives, spend too much time in mere talking, in getting down to work, in contacting other departments, in waiting for work.
- (b) One department tends to get behind another in the chain of production and hold up the whole job.
- (c) The level of errors is far too high—7 per cent.

The first difficulty was overcome by instituting a weekly time sheet for every worker, including executives and directors. There being so many unusual operations, a schedule of operations with a code number for each was prepared and issued.

We found that no exception was taken to this by either operators or clerical workers, as it was carefully explained that it was impossible for us to keep our exacting schedules unless everybody gave us records of how time was being used.

Time Taken on Each Operation is Analysed

The second difficulty was met by the preparation of a time and operation analysis from these records which gave us the total hours spent on punching, sorting, gang punching, tabulating and comptometer checks. This record was made up for 60 day periods as our unit of time must be two months since this is the time required for the field men to get round the country. The first month is spent on the grocery field, the second on the drug field.

An important section of this time and operation analysis discloses "work for other departments." One of the curses of every service department is the number of hours spent on work outside of the routine for other departments. This form of record gave us a complete check as to what other departments were demanding of the production section.

The correction of errors was more difficult, for they are no mere production problem. They may be the

result of a dozen causes such as bad feeling between the supervisor and her staff, a draughty room which has allowed the girls' fingers to get cold, causing an inaccurate touch.

A Coloured Chart Shows Girls Where Errors Lie

Each section head was therefore required to keep a record of errors. This helped her to discover where the majority were occurring and therefore to reduce them. But the big reduction came from an entirely different and unexpected source. It came from the issue of a coloured chart, pinned on the wall in each section concerned and showing the precise number of errors

that has been made in the previous period. The type of error was also clearly illustrated, each one being shown in a different colour. When this chart had been up for six months the rate of error had fallen from 7.1 per cent to 3.5 per cent.

This chart discloses some extremely interesting points. For instance, while the number of errors in every other department was falling, that due to misreading a figure in turning a record over from back to front was still increasing. Finally, this source of error was reduced. But this was the result not so much I think, of care by the supervisor as of the sensibility of the girls concerned to the position of their own section on the chart.

Three Questions on Costing Government Contracts

**Answered by S. J. NOEL-BROWN,
F.A.I.A., F.S.C.C., A.R.Ae.S., A.C.I.S.,**

President, Society of Incorporated Cost Consultants

EXPERTS have exhausted their ingenuity in devising types of contracts as if their one idea and intention has been to make things as difficult as possible for the contractor.

But in the existing forms of contract there are sufficient points to give many contractors and their cost accountants plenty of headaches. As a means of solving some of these problems, the Engineering Industries Association have just published in booklet form (price 2s. 6d.) the paper read by Mr. S. J. Noel-Brown at their meeting in April last.

Among the many varied sections dealt with, Mr. Noel-Brown lists the overhead charges disallowed and also those allowed by Government Departments. In introducing these, the author says:

The Overheads the Government Won't Allow

I know it must seem strange to some contractors to find that Government Departments should even have the effrontery to suggest that certain items in their overhead charges cannot be allowed. Most of these are known, but I will give a brief list:

1. Interest on bank overdraft.
2. Discounts.
3. Capital Expenditure.
4. Interest on debenture or other loans.

5. Income Tax.
6. E.P.T. or N.D.C.
7. Bad debts.
8. Certain donations and subscriptions.
9. Loss of profit insurance.
10. Patent royalties not applicable to the actual contract.
11. Outward carriage where price includes delivery.
12. Depreciation in excess of that allowed by Inland Revenue.
13. Rent in excess of Schedule A.
14. 7th Schedule, 1939, Finance Act allowances.
15. Research funds and/or donations to Spitfire or Bomber or Fighter Funds.

On the brighter side of the picture are the special overheads allowable. These are:

1. Fire watching.
2. A.R.P.
3. Home Guard.
4. Time lost through air raids.
5. Processing.
6. Overtime.

Method of Calculating Profit on Contracts

I now come to the very delicate subject of profit. It is probably unnecessary for me to remind you that you have to forget all you have learnt in ordinary business methods of calculation. (Please turn to page 36)

How to Use GANTT CHARTS for Progress Work

These Simple Diagrams Can Give at a Glance Full Details of Production, Delays, Availability of Material and other Important Data

By E. A. LEVER, B.Sc., B.Com.,
Divisional Manager of a Large Engineering Works

FAILURES to maintain schedules, congestion, slow progress—how often we are troubled with happenings such as these, and how necessary it is for action to be taken immediately by the executives concerned!

A difficulty often experienced in getting quick action is that the facts are hidden in tables of figures which require study before their meaning can be grasped. If, however, the facts are presented in pictorial form, the state of affairs can be seen at a glance, and the reason for a breakdown brought vividly to the attention.

Simplicity is the Keynote of the Gantt System

A particularly useful, simple, and vivid form of chart is that devised by H. L. Gantt. The fundamental principle of a Gantt chart is easily grasped. In it, a single horizontal space represents three things:

- (1) a division of time, such as an hour, week or month;
- (2) varying amounts of work scheduled to be done in the divisions of time described in (1), and
- (3) varying amounts of work done.

For example, suppose we wished to use a Gantt chart to show the weekly progress of the production of a part. A sheet is ruled as shown in fig. 1. The horizontal spaces are each about 1 in. wide. The two columns on the left are for entering part, job or order numbers.

Light Lines Give Week by Week Comparison of Work

Let us suppose that the production planned is 100 in the first week, 150 in the second week and 200 in each of the two following weeks, and so on. These figures of 100, 150, 200 and 200 are then entered on the left hand side of the weekly spaces (fig. 2). Next, let us assume, glancing backwards, that the actual production achieved was 50, 100, 180 and 220 in the respective weeks.

These production figures are charted by drawing a light horizontal line in each week's space, *proportional in*

length as the actual production is to the scheduled production. Thus, in the first week 100 were scheduled and 50 produced, so that the line is drawn across half the space.

In the second week, 150 were scheduled and 100 produced, so that the line is drawn two-thirds across the space, and so on.

In the fourth week 200 were scheduled and 220 produced, so that the line is drawn right across the space (which accounts for 200), and another line is added just above it, equal to one-tenth of the space, so that the two lines, when added together, represent 220.

The lengths of these lines thus show a week by week comparison of the work scheduled and the work accomplished. It is also useful to show progressive figures for the relation between the production scheduled in a given number of weeks and the work accomplished in the same period.

These Charts Show at a Glance How Far Work is Behind

This is easily done. Progressive scheduled figures are entered at the right hand side of each of the weekly spaces, as shown in fig. 3. Thus, on the right of the second week's space a number 250 is entered as the progressive production schedule for two weeks, 450 for three weeks and 650 for four weeks. The progressive production figures are then charted by drawing heavy lines.

In the first week the heavy progressive figure line is the same length as the light weekly line, its end being indicated by a little tick.

In the second week's production of 100, 50 are required to make up the first week's schedule (enabling the heavy progressive line to be drawn to fill the first week's space), and 50 available for part completion of the first two weeks' progressive schedule; hence the heavy line is continued one-third across the second week's space (the whole space representing a scheduled production of 150), its end being indicated again by a tick.

Similarly in the third week, 50 of the 180 produced are available for

FIG. 1.

PART No.	OCTOBER				
	4	11	18	25	
1573	100	150	200	200	

FIG. 2.

PART No.	OCTOBER				
	4	11	18	25	
1573	100	150 250	200 450	200 650	

FIG. 3.

PART No.	MON	TUES	WED	THUR	FRI
1067	100	100 200	100 300	100 400	100 500

FIG. 4.

These charts show the ease with which important progress data can be recorded and read

completing the first two weeks' progressive schedule (enabling the heavy progressive line to be drawn to fill the second week's space), and 130 are available for part completion of the first three weeks' progressive schedule; hence the heavy line is continued 13/20ths across the third week's space, its end being indicated by a tick, and so on for the fourth week.

Thus, if the chart is viewed at the end of the fourth week's work, the heavy progressive figures line will show immediately that the schedule is half a week behind.

They Can Be Used to Plot Supply Data

It will be obvious that little space is taken up by these lines, and in fact a convenient distance apart is only 3/8 of an inch. In this way it is possible to show both the weekly and progressive results for a large number of part numbers on a foolscap size sheet, and thus the progress of each of the parts is watched and also of the parts as a whole, which would be useful when the parts are required to make up sub-assemblies. Lack of balance in the production of a series of related parts is shown up quickly by a Gantt chart when the productions are charted underneath each other.

Again, it may be desirable to plan the start of the production of certain parts at different times. Gantt charts will show this easily.

In these days when we are often up against difficulties with materials, a convenient way of indicating whether materials are available for the production of various part numbers can

(Please turn to page 39)

The image shows three overlapping forms from an accounting machine system. The top-left form is titled 'PURCHASES' and is for the 'SCRAP DEPARTMENT'. It has columns for 'DATE', 'QUANTITY', and 'VALUE'. The top-right form is titled 'SALES' and is for the 'MACHINERY DEPARTMENT'. It also has columns for 'DATE', 'QUANTITY', and 'VALUE'. The bottom form is titled 'NOMINAL PURCHASES' and is for the 'SCRAP DEPARTMENT'. It has columns for 'DATE', 'QUANTITY', and 'VALUE'. Each form contains a grid of data points, likely representing transactions over time.

Three of the forms which help to make the operation of this system a success. Daily departmental analysis of sales and purchases are now possible

One Battery of Accountancy Machines for Three Distinct Trading Divisions

IN 1935 when it was found that, owing to the increase in our trading under its three main divisions, viz. scrap iron, non-ferrous metal and machinery, it was no longer possible to record as speedily as required all necessary data by the laborious hand-written method, our directors gave instructions for the examination of the possibilities of adoption of modern mechanical bookkeeping.

By reason of the variations in our trading, many of the systems of record and types of machine obtainable were deemed to be unsuitable in that they did not cater in one unit for the complete entry of detail essential to the selling side of the business, which it had been decided to convert as the first step in the change-over to mechanical accounting.

Efficient Training of Machine Operators Repaid Time and Cost

Eventually, we decided that a certain accounting machine could be modelled to fulfil all our requirements, which included the complication of weight detail in addition to sterling for each sale of ferrous or non-ferrous metal.

The advantages accruing from the machine records of sales were very numerous. As in other businesses with a large turnover, the chief advantage was that, with the resulting earlier outgoing of monthly statements, the period

This System Gives Classification and Tonnage of Materials and Produces Full Weekly Financial Statements

By **BYRON WILSON, A.C.A.,**

Accountant, George Cohen, Sons & Co. Ltd.,
Iron, Metal & Machinery Merchants & Engineers

of credit was reduced appreciably. Furthermore, proven departmental sales figures were available much sooner for comparison and statistical use.

It should be observed that the undoubted success of our initial sales installation was due in no small measure to the efficiency of the operator who had been trained in a very short time at the accounting machine manufacturers' school, where the needs of our particular business were studied meticulously and stressed in the course of tuition.

Success Calls for Extension of the System

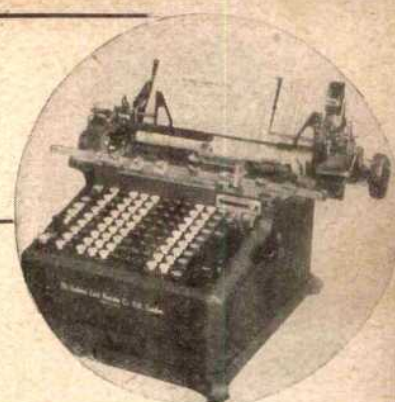
After we had used the one accounting machine so satisfactorily for some six months, it was resolved to extend the mechanisation to embrace the purchase side of our business. Additional

machines were installed and their benefits in speed and greater accuracy of record were apparent in a very short time. With our sales and purchase accounting satisfactorily running and expanded by the inclusion of contractors' plant records to give adequate work for the four machines then installed, it was thought that our greater problem of departmental expenses records might be considered for mechanisation.

Owing to the necessarily lengthy classification of our expenses and the allocation to numerous departments, it was found our requirements were somewhat unusual. However, after detailed examination of the problem a system was evolved which has permitted of all necessary extension to date.

In general, the procedure sales and purchase records is based on depart-

(Please turn to page 20)



National

Accounting Machines

THROUGHOUT the country, "Nationals" are playing their part in the increased production effort in Aircraft, Armament and Shadow Factories.

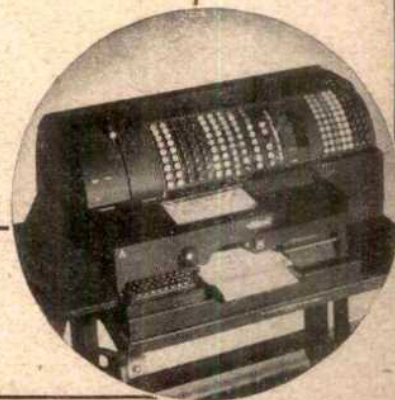
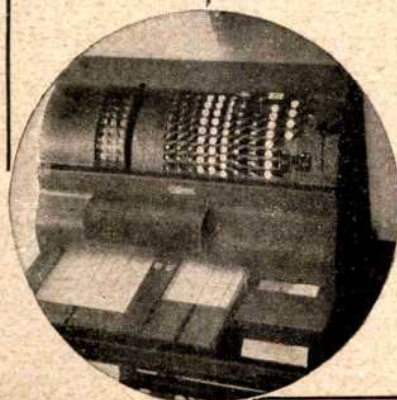
Their flexibility, speed, and automatic features make for efficiency and economy in a large variety of applications such as :—

Costing. Payroll.
Stores. Purchases.
Expense Analysis.
Etc. Etc.



National Accounting Machines

The National Cash Register Company Ltd.
206-216 Marylebone Road, London, N.W.1
Paddington 7070



PROOF SHEET

28TH JUNE 1941 SODAP NON-FERROUS & MACHINERY INVOICES

DATE		DEPT	INVOICE	AMOUNT	DEBIT	CREDIT	BALANCE	REMARKS	PROOF	RECAP
1939	8 2	2	1	100.10.10			100.10.10		100.0.0	100.0.0
1939	10 10	2	2	100.10.10			200.10.10		200.0.0	200.0.0
1939	12 12	2	3	100.10.10			300.10.10		300.0.0	300.0.0
1939	1 1	2	4	100.10.10			400.10.10		400.0.0	400.0.0
1939	3 3	2	5	100.10.10			500.10.10		500.0.0	500.0.0
1939	5 5	2	6	100.10.10			600.10.10		600.0.0	600.0.0
1939	7 7	2	7	100.10.10			700.10.10		700.0.0	700.0.0
1939	9 9	2	8	100.10.10			800.10.10		800.0.0	800.0.0
1939	11 11	2	9	100.10.10			900.10.10		900.0.0	900.0.0
1939	13 13	2	10	100.10.10			1000.10.10		1000.0.0	1000.0.0
1939	15 15	2	11	100.10.10			1100.10.10		1100.0.0	1100.0.0
1939	17 17	2	12	100.10.10			1200.10.10		1200.0.0	1200.0.0
1939	19 19	2	13	100.10.10			1300.10.10		1300.0.0	1300.0.0
1939	21 21	2	14	100.10.10			1400.10.10		1400.0.0	1400.0.0
1939	23 23	2	15	100.10.10			1500.10.10		1500.0.0	1500.0.0
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1939	27 27	2	17	100.10.10			1700.10.10		1700.0.0	1700.0.0
1939	29 29	2	18	100.10.10			1800.10.10		1800.0.0	1800.0.0
1939	31 31	2	19	100.10.10			1900.10.10		1900.0.0	1900.0.0
1939	3 3	2	20	100.10.10			2000.10.10		2000.0.0	2000.0.0
1939	5 5	2	21	100.10.10			2100.10.10		2100.0.0	2100.0.0
1939	7 7	2	22	100.10.10			2200.10.10		2200.0.0	2200.0.0
1939	9 9	2	23	100.10.10			2300.10.10		2300.0.0	2300.0.0
1939	11 11	2	24	100.10.10			2400.10.10		2400.0.0	2400.0.0
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1939	17 17	2	27	100.10.10			2700.10.10		2700.0.0	2700.0.0
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1939	21 21	2	29	100.10.10			2900.10.10		2900.0.0	2900.0.0
1939	23 23	2	30	100.10.10			3000.10.10		3000.0.0	3000.0.0
1939	25 25	2	31	100.10.10			3100.10.10		3100.0.0	3100.0.0
1939	27 27	2	32	100.10.10			3200.10.10		3200.0.0	3200.0.0
1939	29 29	2	33	100.10.10			3300.10.10		3300.0.0	3300.0.0
1939	31 31	2	34	100.10.10			3400.10.10		3400.0.0	3400.0.0
1939	3 3	2	35	100.10.10			3500.10.10		3500.0.0	3500.0.0
1939	5 5	2	36	100.10.10			3600.10.10		3600.0.0	3600.0.0
1939	7 7	2	37	100.10.10			3700.10.10		3700.0.0	3700.0.0
1939	9 9	2	38	100.10.10			3800.10.10		3800.0.0	3800.0.0
1939	11 11	2	39	100.10.10			3900.10.10		3900.0.0	3900.0.0
1939	13 13	2	40	100.10.10			4000.10.10		4000.0.0	4000.0.0
1939	15 15	2	41	100.10.10			4100.10.10		4100.0.0	4100.0.0
1939	17 17	2	42	100.10.10			4200.10.10		4200.0.0	4200.0.0
1939	19 19	2	43	100.10.10			4300.10.10		4300.0.0	4300.0.0
1939	21 21	2	44	100.10.10			4400.10.10		4400.0.0	4400.0.0
1939	23 23	2	45	100.10.10			4500.10.10		4500.0.0	4500.0.0
1939	25 25	2	46	100.10.10			4600.10.10		4600.0.0	4600.0.0
1939	27 27	2	47	100.10.10			4700.10.10		4700.0.0	4700.0.0
1939	29 29	2	48	100.10.10			4800.10.10		4800.0.0	4800.0.0
1939	31 31	2	49	100.10.10			4900.10.10		4900.0.0	4900.0.0
1939	3 3	2	50	100.10.10			5000.10.10		5000.0.0	5000.0.0
1939	5 5	2	51	100.10.10			5100.10.10		5100.0.0	5100.0.0
1939	7 7	2	52	100.10.10			5200.10.10		5200.0.0	5200.0.0
1939	9 9	2	53	100.10.10			5300.10.10		5300.0.0	5300.0.0
1939	11 11	2	54	100.10.10			5400.10.10		5400.0.0	5400.0.0
1939	13 13	2	55	100.10.10			5500.10.10		5500.0.0	5500.0.0
1939	15 15	2	56	100.10.10			5600.10.10		5600.0.0	5600.0.0
1939	17 17	2	57	100.10.10			5700.10.10		5700.0.0	5700.0.0
1939	19 19	2	58	100.10.10			5800.10.10		5800.0.0	5800.0.0
1939	21 21	2	59	100.10.10			5900.10.10		5900.0.0	5900.0.0
1939	23 23	2	60	100.10.10			6000.10.10		6000.0.0	6000.0.0
1939	25 25	2	61	100.10.10			6100.10.10		6100.0.0	6100.0.0
1939	27 27	2	62	100.10.10			6200.10.10		6200.0.0	6200.0.0
1939	29 29	2	63	100.10.10			6300.10.10		6300.0.0	6300.0.0
1939	31 31	2	64	100.10.10			6400.10.10		6400.0.0	6400.0.0
1939	3 3	2	65	100.10.10			6500.10.10		6500.0.0	6500.0.0
1939	5 5	2	66	100.10.10			6600.10.10		6600.0.0	6600.0.0
1939	7 7	2	67	100.10.10			6700.10.10		6700.0.0	6700.0.0
1939	9 9	2	68	100.10.10			6800.10.10		6800.0.0	6800.0.0
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1939	15 15	2	71	100.10.10			7100.10.10		7100.0.0	7100.0.0
1939	17 17	2	72	100.10.10			7200.10.10		7200.0.0	7200.0.0
1939	19 19	2	73	100.10.10			7300.10.10		7300.0.0	7300.0.0
1939	21 21	2	74	100.10.10			7400.10.10		7400.0.0	7400.0.0
1939	23 23	2	75	100.10.10			7500.10.10		7500.0.0	7500.0.0
1939	25 25	2	76	100.10.10			7600.10.10		7600.0.0	7600.0.0
1939	27 27	2	77	100.10.10			7700.10.10		7700.0.0	7700.0.0
1939	29 29	2	78	100.10.10			7800.10.10		7800.0.0	7800.0.0
1939	31 31	2	79	100.10.10			7900.10.10		7900.0.0	7900.0.0
1939	3 3	2	80	100.10.10			8000.10.10		8000.0.0	8000.0.0
1939	5 5	2	81	100.10.10			8100.10.10		8100.0.0	8100.0.0
1939	7 7	2	82	100.10.10			8200.10.10		8200.0.0	8200.0.0
1939	9 9	2	83	100.10.10			8300.10.10		8300.0.0	8300.0.0
1939	11 11	2	84	100.10.10			8400.10.10		8400.0.0	8400.0.0
1939	13 13	2	85	100.10.10			8500.10.10		8500.0.0	8500.0.0
1939	15 15	2	86	100.10.10			8600.10.10		8600.0.0	8600.0.0
1939	17 17	2	87	100.10.10			8700.10.10		8700.0.0	8700.0.0
1939	19 19	2	88	100.10.10			8800.10.10		8800.0.0	8800.0.0
1939	21 21	2	89	100.10.10			8900.10.10		8900.0.0	8900.0.0
1939	23 23	2	90	100.10.10			9000.10.10		9000.0.0	9000.0.0
1939	25 25	2	91	100.10.10			9100.10.10		9100.0.0	9100.0.0
1939	27 27	2	92	100.10.10			9200.10.10		9200.0.0	9200.0.0
1939	29 29	2	93	100.10.10			9300.10.10		9300.0.0	9300.0.0
1939	31 31	2	94	100.10.10			9400.10.10		9400.0.0	9400.0.0
1939	3 3	2	95	100.10.10			9500.10.10		9500.0.0	9500.0.0
1939	5 5	2	96	100.10.10			9600.10.10		9600.0.0	9600.0.0
1939	7 7	2	97	100.10.10			9700.10.10		9700.0.0	9700.0.0
1939	9 9	2	98	100.10.10			9800.10.10		9800.0.0	9800.0.0
1939	11 11	2	99	100.10.10			9900.10.10		9900.0.0	9900.0.0
1939	13 13	2	100	100.10.10			10000.10.10		10000.0.0	10000.0.0

An unusual feature of this sheet is that it contains two separate tabulations of the tonnage of the metals handled

One Battery of Accountancy Machines for Three Distinct Trading Divisions

(Continued from page 18)

mental coding by numbers. The department concerned is signified in this way by entry on the sale or purchase invoice, which is recorded on the ledger card. Thus a reference is established to the source of sale or purchase and the combination of daily invoices affords the total of daily departmental sales and purchases.

Machine Analysis Provides Daily Departmental Figures

This is supplemented for expenses by a numerical code, which is applied to the various classes of expense and is notified by the attachment of a slip bearing such departmental and expense code numbers before the expense invoice reaches the machine operator. The form of expense card employed to allow a weekly total figure to be shown and readily extracted is illustrated above.

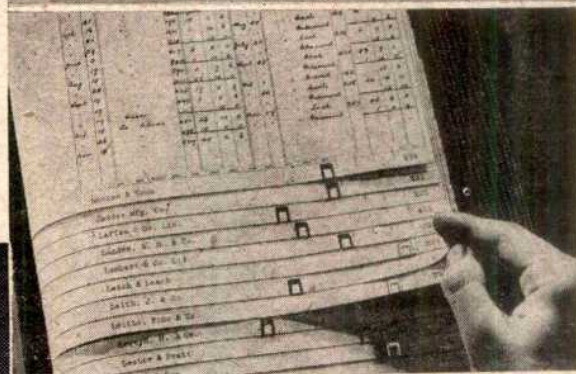
Whilst the sales or purchase proof sheets illustrated do not show daily departmental total, it is to be understood that these figures have already been obtained by a machine analysis of the day's invoices and checked with the independent analysis prepared by the mechanisation control clerk. Thus the proof sheet total can be verified with the grand total of the daily analysis sheets and also provides a check for</

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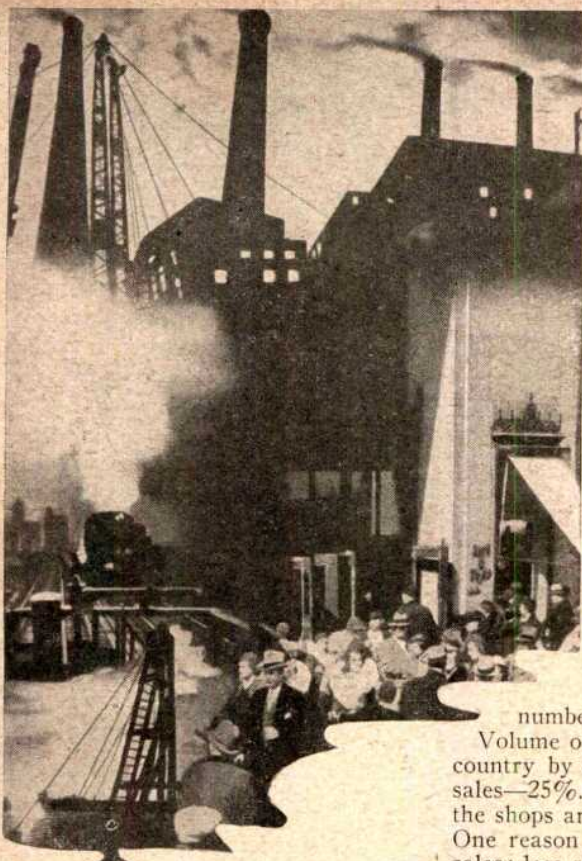
Kalamazoo *Visible Equipment*

Kalamazoo Ltd.

(Proprietors, Marland & Impey, Ltd.)

(Sole)

NORTHFIELD • BIRMINGHAM 31



WAR production up, normal business down." The war-time story continues. As expansion of war production reached a new peak in September, normal business naturally reached a new bottom. The main objective being to bring the war to an end, we must be satisfied. But the difficulties of the small business in particular increase every day.

Production Decline Not Yet Reflected in Retail Sales Figures

DESPITE price control, rationing and short supplies, the shops are still selling around 75% of what they did in 1939. This simply because there are 3 to 4 million extra income earners. Not only are a couple of million more registered workers drawing wage packets, there cannot be fewer than a million women working seriously for the first time. At least another half-million people have taken up active work in office, factory, shop or farm. Rationing accounts for the fall in sales.

Variations in Consumer Power Are Astonishing

AREA variations remain rather astonishing. In terms of money, shops in the N.E. sold 50.4% more household piece goods, in the N.W. 40.2% more, in the Midlands 41.7% more, in the south of England 53.4% more. Yet in Scotland the increase was only 13.6%. In the case of dress piece goods, sales rose by 6.1% in the south of England and fell by no less than 42.6% in Central London and by 20.1% in the London suburbs.

Why should women in the south of

numbers.

Volume of stocks fell throughout the country by about the same amount as sales—25%. But there are signs that the shops are surprisingly well stocked. One reason is the absence of the July sales; less obvious but more interesting is the steadiness of sales in August, due to the reduction in holidays. August is rapidly graduating as a normal business month.

New Movements in Population Indicate Industrial Changes

THERE is evidence that certain new movements of population have set in. 7,600 people have left Oxford during the past six months. But the number of people rationed in the Oxford municipal area has fallen by 13,000-15,000 for different items.

One reason for this fall in the city's population is simple. Whereas before the war 85/90% of the housewives living in Kennington, Cumnor Hill and the two Botley building estates shopped in Oxford, today they are using the nearest grocery shop. For which shop queues, shortage of buses and the blackout are responsible.

I think this trend from central and inner suburbs to outer suburbs and village shops is general in every great provincial city of from 50,000 to 150,000 inhabitants.

In the great cities, the position is reversed. Unfortunately, they are flocking back to London, Manchester, Liverpool, Birmingham and Glasgow because they cannot see any more blitzes in sight. The considerable rise in the sales of central London and West End shops is the most impressive evidence of this situation. But I saw similar evidence in Manchester.

For obvious reasons this trend backwards to great cities is not true of two of our other large cities, viz. Bristol and Hull.

TREND OF TRADE

America Wants Britain to Continue Exports

**Says CECIL CHISHOLM, M.A.,
Business Consultant**

England buy 6.1% more dress piece goods when the average fall throughout the country was actually 23%. I think the answer must be that the population is still swarming south in considerable

Bonds of Government Control Are Drawn One Hole Tighter

LAATEST movement is the use of the new Goods and Service (Price Control) Act on the new utility cloths. The aim is to secure that exact proportions of all materials available are used in the manufacture of this clothing. The special quota of "utility cloth" meeting specified standards of quality is itself rigidly controlled to makers of such garments. But maximum prices and margins have also been fixed for every stage in the process of production by the Central Price Regulation Committee. Take a tweed suit for men. Cost plus 4% is allowed to the maker-up. The wholesaler is allowed 1/6 of his selling price. Selling at a maximum price of 38/6d., the retailer must keep his gross profit at 25% of his selling price or 33 1/3% of his cost. So the consumer will pay 59/11d. including Purchase Tax. So the retailer gets profit on the Purchase Tax.

The one object of price-control being, as I understand it, to get the minimum price, why gratuitously expand the price in this way? Why make the the retailer depend on the size of the Purchase Tax as part of his profit?

Why America Cannot Usurp Britain's Export Trade

WHERE one is allowed to export goods to a certain market, one may still be defeated by the shortage of raw materials, the refusal of licences, the refusal of shipping space. The number of export controls and prohibition orders issuing from the Board of Trade is reaching the proportions of an avalanche. Last month I suggested that the Board of Trade had fallen backwards in its effort to stand straight with America on the possible mis-use of Lease-Lend materials. All the evidence coming from America is in favour of this view. For instance, it is now disclosed (in an American journal) that "the U.S. and U.K. agreement on Lease-Lend exports is based on the principle that the British must maintain about 2/3rds of their export trade in order to get vital

(Please turn to page 37)



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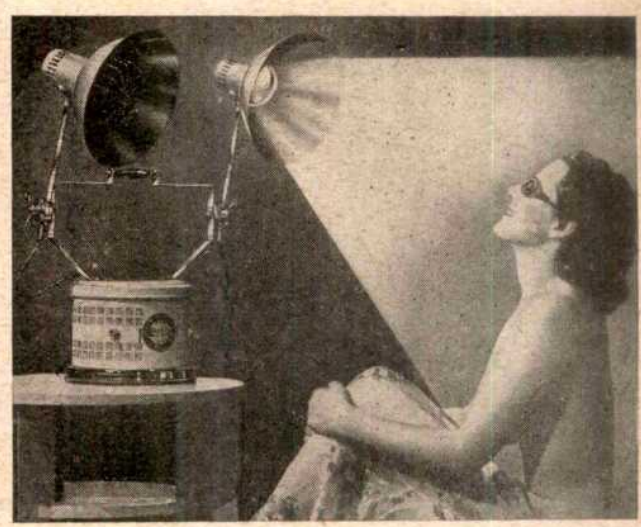
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Nine Short Cuts to Office Efficiency and Economy

Returned Postage Helps to Build Goodwill

ALTHOUGH it means the sacrifice of some few pounds a week, one firm makes it an invariable practice to return to enquirers their unused stamped self-addressed envelopes. They explain that, with the present high cost of printing and the difficulty in obtaining literature to enclose with letters, they are able to make up a considerable amount of goodwill by giving customers the idea that the company is too big and substantial to use other people's postage.

Time Stamp as Reminder of Overdue Account

WHEN posting statements of overdue accounts, one firm uses a modification of a time stamp on the form. This is a rubber-stamp dial indicating 31 days on the outer rim, while the inner circle is divided into twelve months. When a statement is being prepared, a pen-stroke on the outer clock indicates the original dating of the invoice, while a hand in red ink emphasises the elapsed time of the overdue account. Under the date stamp is the simple slogan "Time is Money."

How to Store Direct Mail Material

TO keep together the enclosures that accompany its thousands of circular letters, the mailing department of one big company uses a set of bins. When the department receives an order for a large posting, it places upon a bin a tag with a number and date of mailing on it. As the enclosures arrive—and frequently they come in at intervals of several days before the date of dispatch—they are checked off on the requisition order and placed in the bin. When the day for posting comes, the clerks go to the bins, and take out the needed enclosures.

Typing Staff Shortages Can be Overcome

THE problem of filling gaps in routine work caused by the absence of typists from illness, holidays or staff shortage resulting from Service call-up, has been solved by one firm. The office manager of this company has kept a careful record of all typists who have left to get married or have given up regular office work, for any reason. In peace-time he was able, by keeping track of the addresses of such "old girls", to fill gaps of a day or a week at a time with an experienced substitute, who was thoroughly familiar with the routine of his office. Under war conditions, he is able to help many of his former employees to eke out Service allowances by giving them two or three days' work a week, and also help get his own work done.

Saving Time in Ticket Sorting Operations

FREQUENTLY, it is necessary to sort a group of cards, tickets or sheets which have been originally filed in alphabetical order. Sorting is necessary to obtain statistical record or information. After the information has been obtained it becomes necessary to sort the cards back into alphabetical order. A time-saving method is to number the cards serially before the alphabetical arrangement is broken down. Then when it is necessary to resort the cards back into alphabetical order the serial numbers make it much easier to re-arrange the cards in their original alphabetical order. If the number is placed on the upper right-hand corner, a glance will show where it belongs.

Four Ideas for Paper Salvage

A USEFUL hint for the warehouse that packs small articles and is paying high prices for its corrugated paper and strawboards, is to apply to any printer or publisher for his papier-mache moulds. These moulds make first-class packing material and can be had at a very low figure indeed. The size is that of a book page—crown demy 8vo, or crown quarto are those generally obtainable.

A LARGE saving can be effected when papers have to be fastened together by a touch of the paste-brush on the top left-hand corner of such documents. Pins and clips are valuable metal for making necessities of war.

ALL written or typed letters, where a copy need not necessarily be retained

in the office, should be written on the unused portions of the original letter received. Begin the answer at the foot of the signature, then turning over, commence at the foot of the back. If this method is adopted a minimum of time is expended by both writer and reader in handling the letter, and filing labour is also saved. If a copy is essential, let this be written on the back of the original, and thus only one sheet is necessary for the file.

WHEN envelopes have been used three or four times with new labels they have reached the limit of their normal life but are still useful in another way. Slit them open for making odd notes upon. The cost you nothing and scribbling pads are dear. Circulars printed on one side only are useful for this purpose.

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Industrial Production Equipment

Post-War Offices and Factories Will be Much More Brightly Lit

IN 1922 only 1.3 millions of premises in this country were connected to electricity supply mains. By 1939 the position had changed remarkably so that some eight million out of a total of twelve million premises were already lighted electrically and the consumption of electric lamps per capita during the same period increased from 0.42 to 1.75 lamps per capita per annum.

It may be wondered why lamps per capita have any significance but taken with the fact that the average wattage of lamps used in this country (70-watts) is higher than elsewhere, save the U.S.A. and South Africa (73.5 watts) it appears that consumption of electricity for electric lighting per capita has increased over 400 per cent. in this period. This is accounted for by the increased number of lighting points throughout the country, larger lamps and equally important, more extended hours use per annum. The estimated present consumption of electricity for lighting purposes in this country approximates 5,400 million units per annum.

Voltage Standardisation is a Matter of Urgency

Lack of standardisation is still one of the bugbears of electric lamp manufacturers. Some 87.44 per cent. of lamps sold are for voltages between 170—260 and 8.79 per cent. are for voltages between 100—130. Apart from the tendency to use fewer lower voltage lamps, the gravitation towards 230-volts is most marked and there is a reduction in 200—220-volts but the persistence of actual increase of 240-volt and 250-volt is a hindrance. I believe the Illuminating Engineering Society should lend its full support to change-over to making 230-volts the only standard lighting voltage, and to ask that this be made a matter of urgency in post-war reconstruction.

Why the 5ft. Fluorescent Tube Was Developed

Fluorescent lighting may well be described as the outstanding novelty introduced since the outbreak of war. There is no need to recall the special characteristics of these lamps—their high efficiency, low brightness, and resemblance

Fluorescent Tubes Will Step-up Illumination Standards by Over 500 per cent.

By W. J. JONES, M.I.E.E.,

*Director, Electric Lamp Manufacturers' Association,
President, Illuminating Engineering Society**

to daylight—which have made them so acceptable in industry.

The United States led the way in 1938 in the production of fluorescent tube lamps which took the form of 15-watt 18 in. lamps of white and various colours, and the outbreak of war found us ready to embark on a similar development. As it was known that lamps approximately 5 ft. long had an inherently greater efficiency compared with the smaller types, British manufacturers started by introducing 5 ft. 80-watt fluorescent lamps. This would appear to have been a wise decision, as American practice is gravitating towards the use of longer lamps, especially due to their present pre-occupation on output from factories.

New Standards of Lighting May Be Expected After the War

After the war the field available will be much wider, and modifications of the existing standard lamps adapted to decorative display and other special purposes. Amongst other developments which may be foreseen are the introduction of a range of units in different sizes, down to quite small types, and affording coloured light in remarkable variety. The low brightness of those units will encourage their introduction into lighting schemes as decorative objects—indeed the boundary between the functions of decoration and furnishing illumination may well become much less defined than at present.

With fluorescent lighting, levels of 20—30 foot-candles will be commonplace in offices and shops, while for industrial work illumination of 40, 50 and even 100 foot-candles will be an every-day occurrence.

Ward Harrison in the July issue of *Illuminating Engineering*, the journal of the Illuminating Engineering Society of

America, contributes a valuable article on "Fluorescent Luminaires" and rightly points out that the new light source will inspire new designs of fittings and new lighting technique. Our experience in this country of architectural lamps should materially help us in the design of lighting fittings for use with fluorescent lamps. On account of their low brightness some lighting installations will use bare lamps, especially in exhibitions and when used in lofty positions, but by and large carefully designed fittings will be required for their general application in factories, shops and offices.

Fluorescent lighting makes it possible for eyes to use effectively artificial lighting levels which begin to approximate those of daylight itself. This is not generally true of filament lighting after 40—50 foot-candles are passed.

Flexible Installations Will Solve Many Problems

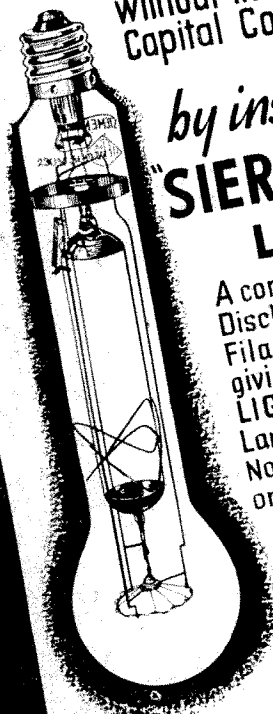
The ideal lighting installation is probably one which permits light to be varied in intensity, a colour change to suit all moods and conditions, and last but not least, the use of a light source which may be moved where it is wanted without lot or hindrance.

Recent lamp developments have gone far in these directions—at a touch of a switch more or less light may be obtained, while the fluorescent lamp opens up possibilities of colour variation.

Flexibility of the installation, to enable the position of light sources to be changed without the inconvenience of flexible wires, is still a problem worthy of concentrated consideration of the installation section of the lighting industry. Even its partial solution may involve radical changes in building details and in any event it requires joint efforts of architects, builders and the lighting industry.

*From the Presidential Address to the Illuminating Engineering Society, October 14, 1941.

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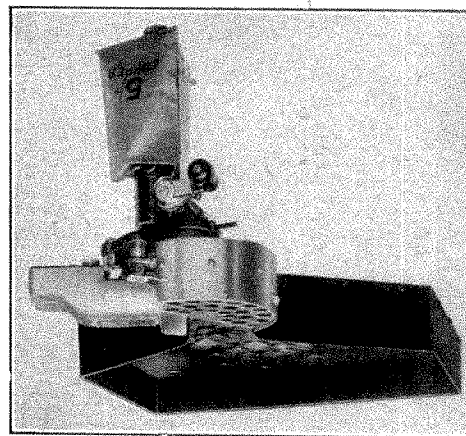
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INDUSTRIAL PRODUCTION EQUIPMENT

Output Up 55%—Production Costs Down 75%

WHEN searching their various manufacturing methods for ways to comply with the Government's call for a big step-up in output this winter, many firms have found one solution in their welding shops. The two main factors that have influenced this decision are that welding costs and the volume of labour required can be substantially reduced while output is increased.

Such a position would seem to be more in the class of unrealisable dreams than an actual hard fact, were it not borne out by actual proof resulting from many years' research. As the following tables show, this decrease in working time and costs can be achieved while output is stepped-up by as much as 55 per cent. by simply altering the size of the electrode used.

The Three Main Factors in Welding Costs

Welding costs comprise the cost of labour, electrode and power. The cost of labour depends on how many pounds of effective weld metal can be deposited per hour—or in other words, how many minutes per hour the arc is in operation. This operating factor is of course affected by positioning devices, jigs, fixtures and

High-Speed Welding Can Give Substantial Savings with Little Change in Working Methods

By **ROBERT L. SWAN**,
Engineer, Lincoln Electric Co. Ltd.

other means for maintaining actual weld production.

As an example, assume a labour cost of five shillings per hour including overheads and an arc speed of 50 ft. per hour. Arc speed is the actual rate of travel of the arc and may be expressed in inches per minute or feet per hour. For differing operating factors the following costs result:

Operating Factor per cent.	Production per Hour (feet per hour)	Cost per Foot.
20	10	6d.
40	20	3d.
60	30	2d.
80	40	1½d.
100	50	1.2d.

From the above, it is obvious that the greatest cost reduction can be made by

maintaining the maximum operating factor. It is, of course, quite impossible to maintain the operating factor of 100 per cent. and, as a rule a factor in the neighbourhood of 50 to 60 per cent. may be considered to be extremely good. Even this shows a reduction in labour costs of anything from 50 to 66 per cent. over that which a 20 per cent. operating factor demands.

One method of keeping the operating factor high is by the use of proper jigs and fixtures and by proper set up. As an example of this, assume it takes a welder two minutes to weld a job and two minutes to set it up. That is four minutes per part, or a total production rate of 15 per hour. By providing a helper for the welder and also a second jig the helper can set up while the welder is welding and the production is increased to 30 per hour, reducing costs considerably.

How the Welding Position Can Influence Production

Another factor affecting the operating factor is the matter of working position. The work should be positioned so that it is easy and convenient to the welder. For example, suppose that the operator can always weld in the down-hand or flat position. The speed will then be, say, 26 ft. per hour. If, however, it is necessary to weld it in the vertical position, the

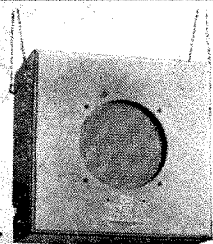
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Effect of Changing Electrode Size.

Electrode size	¼	⅜	½	¾	1	1½
Amperes	24	130	150	250	325	425
Arc volts	110	25	26	30	34	38
K.W. at arc	2.64	3.25	3.9	7.5	11.1	16.1
Consumption rate, lbs. per hr.	2.6	3.3	3.95	7.5	10.7	16.2
Deposit, lbs. per hr. (50% operating factor)	0.57	1.1	1.32	2.5	3.57	5.4
Efficiency of set (%)	47	50	51	55	59	59
Kilowatt input	5.6	6.5	7.65	13.65	18.8	27.3
Interruptions per lb. consumed	18	12	8	5	3	2

Cost per Pound Deposited.

	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Labour	5 9	4 6½	3 9½	2 0	1 5	11
Overhead	5 9	4 6½	3 9½	2 0	1 5	11
Power (@ 1d. per unit)	4	3½	3½	3½	3½	3
Electrode	9	8	7½	7½	7½	7½
Cost of interruption (inc. overhead)	3	2	1½	1½	1½	1½
	12 10	10 2½	8 7¼	5 0¼	3 9¼	2 8¼



Box-type factory speaker

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OUTPUT IS HIGHEST WHERE WORKERS ARE HAPPIEST

—and smartly-fitting overalls that don't shrink contribute more to the well-being and efficiency of employees than many factory managers realize



A group of cruiser tanks nearing completion in the assembly shop of a factory somewhere in England. More tanks, more guns, more planes are needed but output depends a great deal on the well-being of the workers. If they are restricted by tight, shrunken overalls they cannot give of their best.

MORE guns, more tanks, more planes are imperative. And the worker must produce them. Still more output is demanded of every man or woman in the factories.

But with the best good-will in the world the worker cannot always give his "total effort." Women workers need to look their best to work their best. And men and women alike must have comfort and freedom in their working clothes if they're to go "all out" on the job.

DANGERS OF SHRINKAGE

That's why factory managers in these times can't afford to let their workers wear overalls that shrink. A shrunken overall can impede movement and tire the wearer, thus limiting his output. It also gives inefficient protection, may be the cause of accidents. And, in addition, it costs extra money in the long run because it wears out sooner, needs replacing sooner.

Nowadays many of the biggest employers of labour both in factories and institutions are

insisting on "Rigmel"-Shrunk cloth for workers' overalls and uniforms. "Rigmel" - Shrunk overall cloth can't shrink by more than a negligible fraction of an inch per yard however many times it is washed. "Rigmel" is laundry-tested shrinkage. In fact, the British Institution of Launderers say of it, "If the public can be persuaded to insist upon a "Rigmel" guarantee, there will be no more trouble through the shrinkage of cotton fabrics."

Why not put your workers in smart overalls that will always keep their fit and comfort? The staff will look better and they'll work better and output will benefit. All good suppliers can quote you for "Rigmel"-Shrunk overall cloth or you can buy ready-made protective garments in small quantities from retail outlets.



"Rigmel"-Shrunk Laundry-Tested
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speed may only be 11 ft. per hour. It is obvious, therefore, that proper positioning enabling welding to be done in the flat position makes for high speeds and, therefore, helps to reduce operating costs.

Considerable cost reduction, too, is possible in the production of welded parts through the application of special solutions to eliminate the adherence of spatter. This solution can be applied with an ordinary paint brush to the welded part. It cuts weld cleaning time by 20 per cent, to 60 per cent.

How to Achieve An Output Increase of 55%

Now, assuming that the most favourable set-up has been devised, the next important point to be considered is the effect of increasing welding speeds by the use of correct type and largest diameter electrodes. Assume the following four arc speeds for different sizes or types of electrodes. The set-up time will, of course, be the same in each case. To produce a unit of, say, 100 feet of welding, will take:

Arc speed per hour ...	20	25	30	40
Arc time, hours ...	5	4	3.3	2.5
Set-up time, hours ...	2	2	2	2
Total time hours ...	7	6	5.3	4.5
Cost, labour and overhead (@ 5/- per hour)	35/-	30/-	26/6	22/6
Cost reductions ...	—	5/-	8/6	12/6
Production increases %	—	17	32	55

Note that, in spite of fact the set-up time is the same in all four cases, there is a marked increase in production with no increase in equipment or floor space.

The next question is, how can arc time be increased for minimum welding cost?

There are two ways. One, increase the size of electrodes. Two, increase electrode deposition efficiency with proper type of electrodes.

The table at the foot of page 28 shows the effect of changing electrode size and also the cost per pound deposited. This comparison of costs and output shows the tremendous savings which can be made by this means. But cost reduction is not the only benefit obtainable by using the largest size electrode practicable. An

improvement in the quality of welding is often assured—especially where multiple passes are used.

These few facts by no means give a full picture of what may be saved by giving careful consideration to the various factors which can influence welding costs and production, but they do show that here at least is one field which can play a vital part in bringing British engineering output nearer to the desired mark set by the Minister of Labour.

New Extinguishers for Fighting Incendiary Bombs

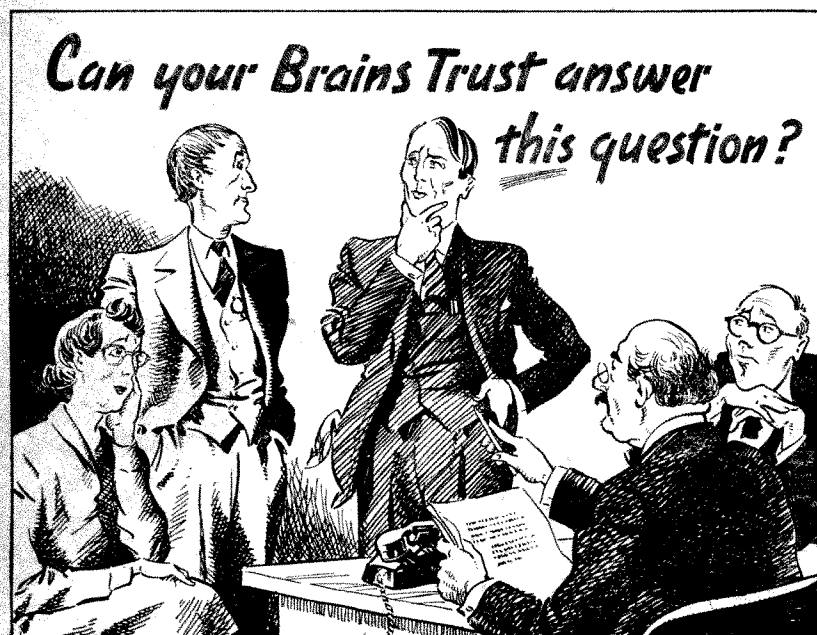
ONE of the latest types of portable bomb and fire extinguisher gives a high-pressure finely atomised jet of water and carbon dioxide gas. A standard machine of this type is a cylinder of 2 gallons capacity, with a 42 in. flexible hose and a nozzle, which is brought into operation by a slight blow upon a knob, when there is given instantaneously a jet 30 ft. in length.

The fire-fighter is fitted with a heavy belt round the body, having two large clasps by means of which two extinguishers can be suspended from the belt, one at each side. The two flexible nozzles also can be held one in each hand, and when the fire is reached the operation is started by stooping down, allowing the cylinders, each about 2 ft. high, to rest on the floor and then hitting the knobs

with the lower part of the right and left hands.

In this way one man can bring into operation immediately two powerful jets. As soon as the bomb or the accompanying fire is extinguished the flexible hoses can be nipped by bending to stop the jet, and then another fire approached and the jets again released.

These extinguishers contain water and a small sealed seamless copper canister of compressed carbon dioxide gas. When the knob is pressed down an internal sharp-point pierces a thin copper sealed cover in the canister and releases the carbon dioxide into the water, giving at once a high pressure jet of water and gas mixed, discharged through an internal pipe which dips to the bottom of the cylinder.



YOUR CONTINUANCE — OR YOUR ANNIHILATION—may depend on how you answer this question, and what action you take.

No doubt you will have provided the best possible equipment for dealing with Incendiary Bombs and resultant fires. Then here is another question which does not need the Brains Trust. Can your squads use the equipment

you have provided in the most efficacious way?

NUSWIFT offers the service of their trained lecturers and instructors, who will not leave your premises until your staff can answer such questions as those above — and all other questions about how to fight fires on the spot with great speed, complete confidence, and efficiency.

Q. If you were alone in the Stockroom, and an Incendiary Bomb fell through the roof, would you

- A.** (a) give the alarm?
(b) run for help?
(c) use the nearest Extinguisher single handed?

AT THE CRITICAL MOMENT your staff will be a tremendous asset if trained. If not, a grave liability. Industrial squads trained by NUSWIFT and with the right equipment, have already been responsible for saving thousands of lives and millions of pounds' worth of property. A post card to our Technical Adviser

will bring you full details of this vital service.

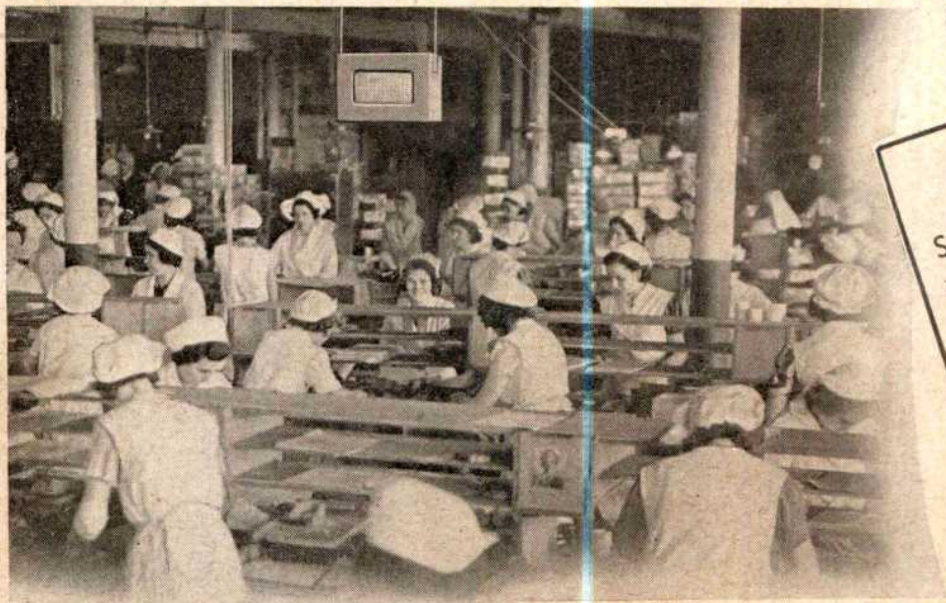
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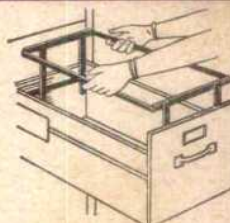
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Quality equipment of every kind such as filing systems and supplies, visible record systems and office furniture may be inspected at our showrooms throughout the country.

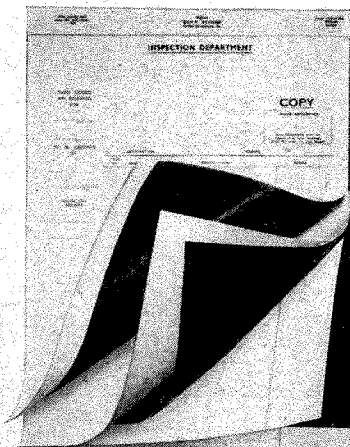
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Especially useful where sets have to be re-inserted into typewriters for a second or third typing.

When completed carbons come away in one pull leaving finished forms in one hand, carbons in other.

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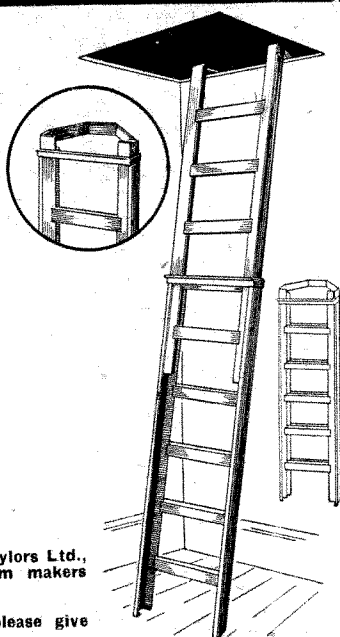
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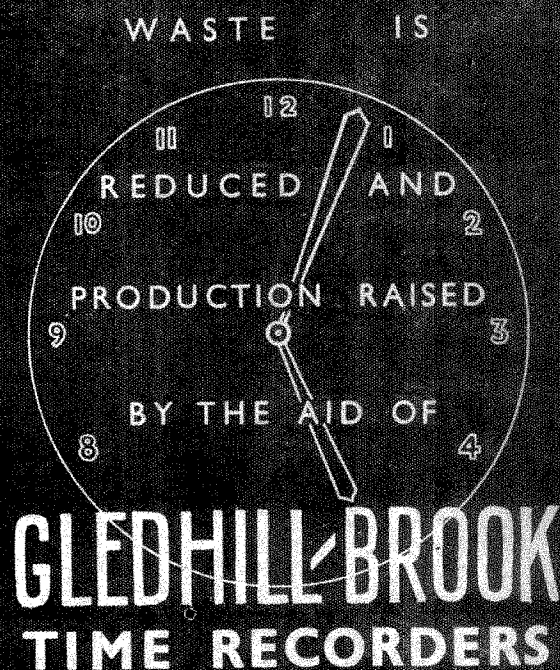
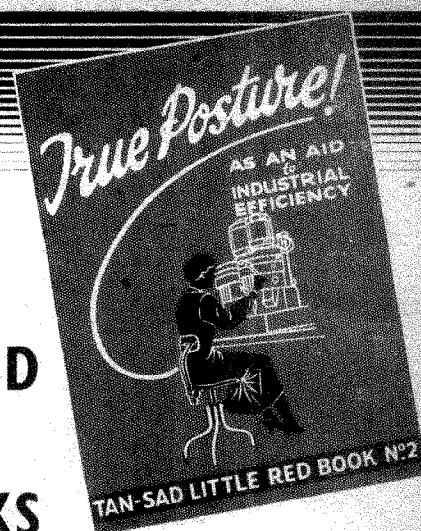
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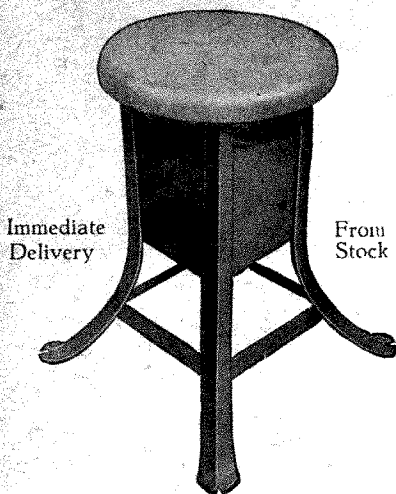
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Model 2—Extra large compartment and special seat 25/-.

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*ALL METAL CONSTRUCTION

*LOCKER COMPARTMENT UNDER SEAT (hinged to form cover).

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INDUSTRIAL PRODUCTION EQUIPMENT

NEW for the Office and Factory

●Readers are invited to make use of this valuable information. The name and address of the manufacturer of any product described may be had on application to the Editor, BUSINESS, Whitefriars House, Tallis Street, London, E.C.4. To simplify your request you may refer to the items by number only.

●Manufacturers and distributors are invited to send complete information about their new products for inclusion in this feature.

27 INSPECTING SCREW - MACHINE PARTS

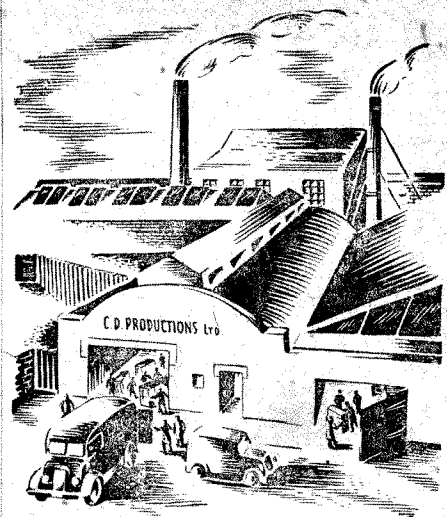
A new optical device for inspecting screw machine parts and similar work up to about 3 in. dia., has just been introduced. It is a simple device provided with a lens which gives almost instant focus, and, being large, both eyes can be used for critical examination from different angles and at various distances. Adequate illumination is provided by a 40 W lamp which plugs into a standard lighting circuit.

28 INTERNAL GRINDING MACHINE

An ingenious new internal and face grinding machine has been designed. A feature of the machine is that, in addition to the table reciprocating motion, the wheel head can also be made to reciprocate if required. On internal work the in-feed motion of the wheel head is adjustable to 0.0001 in. The automatic in-feed-motion for the grinding head is adjustable between 0.0001 and 0.0015 in. per table stroke. Three table feeds are given by a 1-h.p. motor through a 3-step cone pulley; the wheel head is driven by a 1½ h.p. motor, and the work head is driven by a ½ h.p. reversible motor.

29 DISTANCE THERMOMETERS

A Booklet on Siemens' electrical distance thermometers has recently been published. This new list includes a description of the bridge cross coil system which is used particularly when the source of current supply is the mains which are subject to voltage variations, and the "null" system which gives the highest degree of accuracy and sensitivity. This latter instrument was designed as a



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INDUSTRIAL PRODUCTION EQUIPMENT

result of researches at the Cambridge Low Temperature Station of the Food Investigation Board. These instruments are particularly applicable at the present time in connection with cold stores, grain elevators, food manufacture and for chemical works, heating, ventilating and air conditioning plants.

30 DYNAMIC FATIGUE TESTING

Metal which in use is subjected to frequently repeated cyclical stresses will fracture under a load much below the magnitude of the static stresses necessary to cause a breakage. A static test, therefore, does not give a true picture of the properties of a material under working conditions. In order to determine the true fatigue limit of the material it is of great importance to subject test pieces to rapidly alternating or fluctuating stresses. Dynamic testing takes longer than the static process, but the time factor is considerably reduced in a new type of duplex fatigue-testing machine just put on the market.

This machine has been designed to carry out fatigue tests of the Wohler cantilever type upon two rotating bar specimens under load simultaneously and is particularly suitable for routine testing. A three-phase synchronous electric motor supported by the cast-iron machine housing carries the chucks which hold the specimens by spring collets at both ends of the extended gauge.

Music in the Canteen

WHAT is the law of copyright regarding musical performances in a works canteen?

What fees have to be paid for gramophone records played in a canteen?

What hours of work and overtime are permitted in the catering trade?

These questions and many other problems which constantly arise in an industrial canteen are answered in simple and concise form in *Hotel-keepers—This is the Law*, by R. S. W. Pollard and G. B. Erskine (London: John Crowther, 5s.). The law for hotel-keepers is much the same as that for works canteens, especially on points such as those given above.

Among the legal decisions which affect industrial canteens in which musical performances are given are:

- (1) Any unauthorised performance in public is an infringement of copyright.
- (2) Music provided in any public place, such as a canteen, is a public performance.
- (3) Music coming from a radio set is another performance, quite separate and distinct from the performance in the broadcasting studio from whence it is relayed.
- (4) The playing of a gramophone record is a separate performance of the music, work, etc., recorded on it.
- (5) The manufacturer of a record has a copyright in it which is additional to and quite distinct from the ordinary musical copyright.

Factory canteen managers, already beset with numerous problems, will find this little volume of great value in settling knotty legal queries which often arise.

A Direct Method *of checking epidemic* **COLDS & INFLUENZA** *among Factory Staff*

**Proved 90% effective
in large Factories**

THE most important factor in the reduction of absenteeism in Works through Winter Colds, 'Flu, etc., is the prompt and proper treatment of all employees developing the very first symptoms of infection.

This fact has been proved by a number of large firms who, in recent years, have concentrated on this aspect of epidemic prevention. The method used is as follows:—

All employees are instructed to report at the First-Aid Room immediately they develop any symptoms of a Cold, Sore Throat or 'Flu.

Each man or woman thus reporting is given the well-known "Two-Way" treatment with T.C.P. Antiseptic. This consists of a thorough throat spraying (or gargle) with T.C.P., followed by a small internal dose of T.C.P. in water.

The employee is instructed to report again for a further treat-

ment before leaving at night, and is encouraged to continue the treatment at home.

The effectiveness of this treatment is due to its combined action in the nose and throat, and also in the system itself. Owing to its completely safe *internal antiseptic action*, T.C.P. greatly assists the rapid elimination of the toxins in the system which cause feverishness and general Influenza symptoms.

Results, in fact, show that, provided this treatment is given promptly, Colds and Influenza can be completely checked in approximately 90% of cases. What is still more important, nasal and throat symptoms generally clear up overnight, so that the patient is able to return to work without the risk of passing on infection to others.

A great advantage of this method is that many employees are already familiar with the T.C.P. "Two-Way" treatment for Colds and have confidence in it. Consequently it is a relatively simple matter to obtain their co-operation in reporting at the First-Aid room—and also in continuing the treatment at home.

Further details of the method will gladly be sent on application, together with prices for bulk quantities of T.C.P. Antiseptic. Please write to: British Alkaloids Ltd., 69, Old Broad Street, London, E.C.2.

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THE MODERN "TWO-WAY" TREATMENT
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YES, WE CAN. MAY WE HELP YOU?

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How to Cost Government Contracts

(Continued from page 16)

lating or dealing with costs, when dealing with the question of profit calculation. The Ministries undertake to pay fair and reasonable profits. Their idea of fair and reasonable profits is very different from what we would regard as fair and reasonable in our ordinary line of business.

Their idea of a fair and reasonable net profit at the moment is from 5 per cent. to 7 per cent. on labour and overheads, 5 per cent. on material and 5 per cent. on bought-out parts.

How to Calculate Profit on Various Contracts

This profit business is always a sore point, particularly when, as already explained, a certain number of overhead charges are disallowed before the question of profit is even considered.

Time and Lime Profit Example:

In this Time and Lime Profit example, the following simple figures are self-explanatory: labour charges are £100, overheads £100, making a total of £200, material cost £50 and bought-out parts £20, giving a total of £270. In order to make it clearer I will set out in the following simple figures which are self-explanatory:

Labour	...	...	...	...	...	£
Overheads	...	...	...	...	...	100
						100
						£200
Material	...	...	...	...	...	50
Bought-out parts	...	...	...	...	...	20
						£270

Profit calculation:

7 per cent. on labour and overheads	14	£
5 per cent. on material	2.5	
5 per cent. on bought-out parts	1	
	17.5	
	£287.5	

Maximum Price Profit Example:

Estimated cost is say	...	£
The agreed profit on the contract, which is included in the £10,000 is	500	
If the cost is £9,000 the rate of profit still remains at 500 Therefore the contract price	£9,500	
payable is	£9,500	

Target Price Profit Example:

Total cost, including profit of 5 per cent. is	...	£
	50,000	
The actual cost comes to	£40,000	
The profit allowed is 5 per cent. on £50,000 which is	2,500	
Making a total of	£42,500	
The saving on the contract is therefore	£7,500	
	£42,500	
If it is agreed that the contractor shall receive 10 per cent. of the saving, this will equal	750	

Therefore the total value of the contract to the contractor is £43,250 As against an actual cost of £40,000

Fixed Price Profit Example:

The agreed price of the contract is say	£10,000
In actual practice the cost comes to	£9,000
The saving is therefore	£1,000

TREND OF TRADE

(Continued from page 22)

foreign exchange to buy materials unobtainable in the U.S." This makes hay of the D.O.T.'s chatter about ending the export drive.

Incidentally, however much the wicked Americans might desire to take over Britain's export trade, there is a limit to what they can do in fact. The American journal, *Time*, gives an excellent instance:

"Argentina buys British machines, British tools, British steel, and pays for them in wheat and beef. Under the new agreement, much of this exchange must stop. Argentina will get U.S. steel, machines, tools—if she can get U.S. priorities. (Some priorities for Latin America have already been granted). And the U.S. cannot be paid in wheat and beef. What then? Henry Wallace's Economic Defence Board is likely to sit many months before this problem is solved."

I think this is unanswerable.

An American View on the Trade Agreement

Meantime, there is a wide range of articles that we can still export. I prophesy that the range of permitted exports will increase as civil servants regain their shattered nerve. Here are the views of an American executive to a colleague in London (by Clipper, October 7th):

"The agreement between our two governments is simply to the effect that Britain will not export to South America materials obtained from us on Lend-Lease. This seems very logical. It passed with very little notice as far as American business was concerned. In fact, your embassy here was very smart in jumping in with the trade agreement the very minute that the lend-lease export situation showed up, as it might have been made into real capital by the isolationists. Certainly nothing could be booming more than the British wool products market here, and I was told that a single big importer, who supplies Peck and Peck, recently received 40,000 sweaters, cardigans, etc."

Incidentally, one London advertising agent, specialising in export, tells me that only one of his clients has not increased his export advertising for 1942. Others say that their clients are maintaining the volume of export trade on the level of the previous year.

More Stringent Methods Needed to Get Female Labour

IF all out aid to Russia means big changes in our internal policy, as I indicated last month, what about Mr. Bevin's new demands? Looked at superficially, they mean an enormous increase in the number of workers drafted from the army, of women

drafted from home, office and shop into factories.

In actual fact, however, the big increase will have to be got in other ways. The army will not release a large number of workers, however skilled, in my view. The output will have to be found (a) by improving methods of production at every point (b) by translating the call-up of women for war work from a farce into a fact.

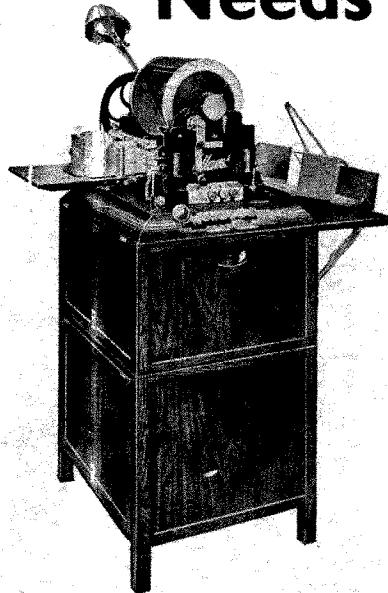
Shilly-shally methods of the Ministry of Labour have resulted in the biggest dodging of a call-up ever known in this country. Some Labour Exchanges have not been able to enrol more than 5% of the women called up. Because 90% of the spinsters and wives between 20

and 25 are doing paid work, because 97% of the married women in these groups do housework, they have been allowed exemption.

A much more stringent method of classification will have to be used. A beginning is being made with the retail trades with over 500 local committees to advise individual releases. The same vigorous comb-out technique must be applied to women civil servants, bank clerks, insurance clerks, typists and housewives.

Such methods will eventually yield another 500,000 women workers for the factories, if it be carried on through from the 20-year-olds to the 40-year-olds.

EVERY BUSINESS Needs a Duplicator



No process or appliance has yet been devised or invented to produce more perfect Duplicating than Ellams range of Duplicating appliances.

For nearly 50 years the resources of money and scientific personnel of the entire Company have been devoted to the development of Duplicating equipment, with the result that to-day nothing more efficient is obtainable. Ellams group of Duplicating Machines range at varying prices from the small Bantam Flat Bed Model to the Automatic Electric Self-feeding Rotary.

ELLAMS CARBON PAPERS, TYPEWRITER RIBBONS, DUPLICATING INKS AND STENCIL PAPER

Ellams Carbon Papers achieved popularity some forty years ago because they were the first Carbon Papers in the World to be clean to handle and smudgeless in operation.

To-day these things are taken for granted and the outstanding attribute which causes so many users to insist on Ellams Carbons is Economy — NOT cheapness in first cost but Long Life; you can use them time and time again. They will still be giving good service when two or even three lots of Carbons of lesser quality (although not greatly less in price) have had their day.

Write for full information.

Ellams

DUPLICATOR CO. LTD.

ASTOR HOUSE, ALDWYCH, LONDON, W.C.2

Phone: Holb. 5365.

MAKERS OF BRITISH DUPLICATING EQUIPMENT FOR 50 YEARS.

Another Twin-Shift Idea

Weekly Average of 56 Hours Proves Solution to One Firm's 7-Day Week Problem

THE introduction of the twin-shift method to overcome workers' objections to a seven-day week has proved a blessing to many concerns. There are, of course, many variations of the basic idea. These adaptations are naturally made to adjust the requirements of the firm and to meet the various objections raised by the workers themselves.

Arguing that anything from 47 to 56 hours may be considered a reasonable equivalent to six days' work, Mr. Eric A. Bevan, technical manager of Beck, Koller & Co. (England) Ltd., has explained the twin-shift method adopted by this firm in a letter to the *New Statesman and Nation*.

While we take no credit for the invention of a new shift system, Mr. Bevan says, we are not aware of such a system having been used in industry before. This system, which has now been in operation at this factory for three months, is most successful, and takes into account all those difficulties of transport which are accentuated by black-out conditions and air raids and,

moreover, allows the men ample leisure time to spend at home to carry out their shopping, gardening and other pursuits.

The men themselves like the system, and the output of work has increased considerably since it was introduced in place of the two-shift system of twelve hours, which itself was introduced to replace the three-shift system of eight hours, which it was necessary to abandon on account of the difficulty of shift changes at 10 or 11 p.m. during the air raids that we suffered last winter.

This System Works on a Three-Weeks Rotation

The system now in operation consists of three-shift personnels, but only two shifts are worked in each period of 24 hours, the changeover taking place at 6 p.m. and 9 a.m. only. Thus a night shift of 15 hours (6 p.m. to 9 a.m.) is followed by a day shift of nine hours (9 a.m. to 6 p.m.). If the three personnels follow each other in strict rotation it will be observed that each of these works alternately a night shift

followed by a day shift followed by a night shift, and so on, with a complete break of 24 hours between each shift, and night work occurs once every three nights. Further, it will be noticed that no enforced change is necessary in order to prevent the same shift personnel always working the same period—for example, Saturday night or Sunday daytime—week in and week out. The rota changes automatically each week for three weeks, when the whole cycle is completed. The hours worked by each shift personnel will differ each week for three weeks, and are 63 hours, 57 hours and 48 hours respectively, which thus make an average of working hours per week over the three weeks of 56 hours.

When the 15-Hour Night Shift Would Fail

The system as outlined above suffers from two main defects: the long night shift of 15 hours would be entirely unsuitable to a factory where the men are employed on routine or mass production work, where undoubtedly the efficiency would be likely to decrease during the latter hours of this long night shift; and further, from the point of view of payment it is perhaps more expensive than the usual three-shift system on account of the large number of hours of overtime, if overtime is based, as it should be, on a shift period of eight hours.

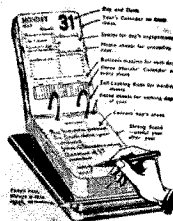
Make the most of your
Imperial
Typewriter



We shall be pleased to send you a copy of our booklet on the war-time care of your typewriters.

Imperial Typewriter Co. Ltd., (Dept. 7), Leicester

SAVE Time and Worry every day with 'SYSTEM' Desk Calendars



Without obligation Fill in and post the Coupon **TODAY...** for full description & prices

Use a System Desk Calendar yourself—place one on the desk of every important member of your staff. See from the accompanying illustration how simply this unique device operates—and yet how complete, automatic and accurate is the service it renders you. At the top stands the day's date in large type; below it, an appointment sheet for the day marked off by hours and half hours; then comes a convenient Calendar for the current, past and next months; below it a big sheet for the day's memos, notes and reminders: there is one of these large sheets for every day of the year, giving ample room for all records. As one long-time user says: "It is the one indispensable desk assistant for every business man." Models with 1942 sheets are now ready.

To: **SHAW PUBLISHING Co. Ltd.,**
6 Carmelite St., London, E.C. 4

Please send me, without obligation, full particulars and illustrations, with prices, of the System Desk Calendars.

Name

Address

B. Nov. 41.

How To Use Gantt Charts for Progress Work.

(Continued from page 17)

also be arranged on a Gantt chart. Thus, if the horizontal spaces used for charting the production figures are made a little deeper, lines can be drawn to show the material position. As an example, in fig. 4 a chart is drawn in which production figures are represented by the solid lines and the material available is indicated by the dotted line.

Usually it is only necessary to chart progressive figures for material, although weekly or other deliveries can be indicated if desired. In the example shown in fig. 4, only one item of material is charted, although several may be involved in the production of a part. Often, however, the availability of one kind of material, such as duralumin for an aircraft pressed part, governs the production of the part.

Daily Performances Can Also Be Charted

Another application of special interest to progress departments is a Gantt chart drawn to show, say daily, the progress of work through various operations. The operations are given in order down the left hand side of the chart, and the work done on each is charted by the Gantt method opposite the respective operations.

Gantt charts can be drawn similarly to compare all kinds of "performances", current and progressive, with scheduled standards. An important use, which must await a further article, is to show how each piece of machinery in a shop is being used, and if idle, the reason for the idleness.

AN enterprising manager of a large firm who was worried over the increasing cost of packing paper, looked round his establishment and discovered a great many scraps found their way into the waste-paper baskets. On careful investigation he found that even if the price of paper had risen, the amount paid by the waste-paper merchant was proportionately higher. As a result, he purchased a baler, and the waste paper was baled up regularly and sold at the sum of ten pounds and over every month.

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The increasing demand necessitated by the War effort upon industry's personnel, applies in the first place to the Drawing Office. The Ruthurstat process is in certain factories reducing eighteen months' tracing of Engineers' Drawings to six weeks', at a cost of £1,500, as against £4,500. In addition to its importance to the Drawing Office, it serves as a general utility unit, interdependent with the whole organisation.

No Dark Room
No Focus
No Skill

British Patent



The strain placed on executives in relation to Government Forms, Tenders, Contracts, etc. (which require many hours laborious typing and checking), can be relieved by the installation of the Ruthurstat process, which enables you to obtain exact errorless copies of vital documents.

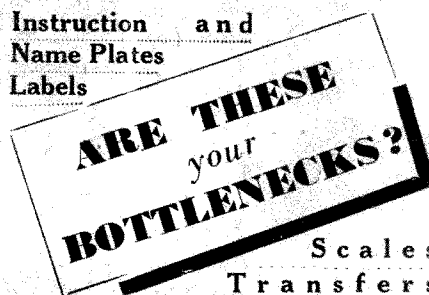
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ALDWYCH - LONDON, W.C. 2
HOLBORN 4737

The Ruthurstat Electro-Copyist

Full range of sizes from Office Models to 42 in. x 32 in. Engineering Models
10 hours typing reduced to 30 minutes
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If so, follow the example of the Air Ministry and other large contractors who telegraph their orders regularly and get prompt delivery. Being produced in durable paint, "TRAPINEX" Paint Transfer will go on plastics, metal, glass or any smooth surface and stay put. Prices are right so speed up production and

Use TRAPINEX Paint TRANSFERS

- ★ . . . Speedy Delivery
- ★ . . . Speedy Application
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FACTORIES
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ETC.**

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2852 (two lines)

Tonic Talks for Salesmen

Some Points that Really Tell in Selling

MR. SHELTON COX, sales manager of a leading firm of loose-leaf book manufacturers, has published a number of tonic talks under the title of "From the Sales Manager." Apart from their own intrinsic value in putting pep into salesmen, the little book, published at 2/-, is also giving valuable help to the Stationers' Association Spitfire Fund, to which all profits are devoted.

Here are a few extracts which will give an example of Mr. Cox's pungent style.

THE COLD CANVASS. That's an American expression of great directness. Most expressions from U.S.A. seem to hit the mark. It means the cold-blooded canvass of new business. It's the hardest thing a salesman has to do and calls for all the qualities of endurance, stout-heartedness, determination and persistence he may possess.

If we would set aside part of our time to cold-canvassing each day—stomach the rebuffs and stick it with enthusiasm and sincerity—there is no doubt more sales could be made.

THE ADVENTURE OF SELLING. If I had my way I would send every young man who wants to be a salesman down Leather Lane in the City of London. Every lunch time hucksters sell their wares. It's a cold, cold canvass. They have only one hour in which to work up their buyers to fever heat. Short enough time in which to entice hard-earned sixpences into their pockets.

Selling has no use for dull eyes and lagging feet. The prize is to the swift, the eager, the young and adventurous. Not, be it said, young in years. Mere age is of no account. I know men of 21

who are 102. I know men of 60 who are Peter Pans in spirit, with the wisdom of Solomon.

IF YOU KNOW IT'S "NO" SAY "NO." I wrote that cryptic little note in my pocket-book. Some days later I read it and wondered what on earth I wrote it for. Did it mean anything at all? I began to doubt the complete propriety of the occasion on which it was written. Then a matter cropped up which made it all clear again. This is what was in my mind. When you are asked to do, or give or propose a thing to your firm, and you know quite well the answer will be "No," then don't beat about the bush with your customer. Say "No," and don't budge. Any temporising, such as "Well, I'll put it up to them and see what they say," will lead you into endless difficulties. It would be better if you took a chance and said, "Yes," and commit your firm and take a rap if necessary.

If you want your firm to have complete confidence, you let it be your habit to be firm in your dealings. Firm, but just. Then if at any time a concession has to be made your word will carry weight.

FAINT HEART NEVER WON FAT ORDER. Faintheartedness in selling is fatal. It leads a fellow on to reduce his prices and demonstrate cheaper quality goods. Expense is a comparative term bearing strict relation to the value offered. If a thing is good, expense as such, does not enter into the argument. The sale does not depend so much on s. d., but on the sales value of such a sign to me. I've no use for fainthearted salesmen. Be Bold in your selling, always. Success goes to the Brave!

CLASSIFIED ADVERTISEMENTS

RATE—2/6 a line (average 7 words to a line). Minimum 3 lines costing 7/6; each additional line or part of a line 2/6. Box No. counts as one line and is to be paid for; replies are forwarded free of charge; 2½% discount for 3 insertions, 5% for 6, 10% for 12. Payment with order for single insertion.

LITERARY

Short Story Writing.—There is a short cut to successful story writing—the Regent way. Send for free booklet.—Regent Institute (Dept. 68L), Palace Gate, London, W.8.

OFFICE EQUIPMENT FOR SALE

"A Large Selection of Ex-Government and Other Steel and Wood Office Furniture, including Filing Cabinets, Desks, Card Index Cabinets, Etc. Also Plan Cabinets, New and Secondhand, at Lowest Prices.—Write for Catalogue, The Miscellaneous Trading Co., Ltd., 134/5 High Holborn, W.C.1. HOLBORN 4894."

One Insurance Franking Machine for sale, practically new, supplied by Romeo-Neopost Ltd., total cost £164 9s. 0d., seven months ago. For offers, apply Box 528, BUSINESS, Whitefriars House, Tallis Street, E.C.4.

TIME RECORDERS

Staff Time Checking and Job Costing Time Recorders (all makes) for quick cash sale, exceptional condition.—Write "Betareool," Box 345, BUSINESS, Whitefriars House, Tallis Street, E.C.4.

WANTED

Office Furniture and Safes urgently wanted. Good prices paid. Send description DALL, 113 High Holborn, London, W.C.2. Tel. HOLBORN 2584.

FOR SALE

Two Protectograph Cheque Writers, in good condition and little used—offers to MacWhirter Ltd., Service House, North Road, Cardiff.

IT'S THE LEAST YOU CAN DO—

Give One Penny each week
to help the RED CROSS
care for the wounded.

Start a 'Penny-a-week' scheme where you work. Send a postcard to the Lord Mayor of London, Mansion House, E.C.4, for full details. Red Cross thanks this Journal for the free gift of this announcement.



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and All Business Appliances BOUGHT AND SOLD, HIRED AND REPAIRED

SAVE TIME—HIRE AN ADDER FOR STOCKTAKING

ADDOGRAPH

The Simplest Portable Adding, Listing
Machine

Delightful to use.



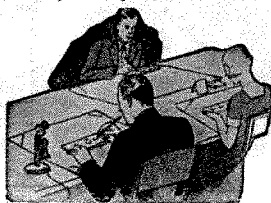
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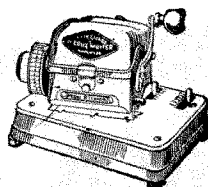
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When ordering state for what purpose
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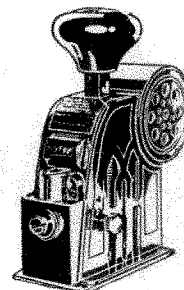


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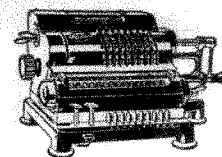
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And let your business-getting letters look
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stamps by using the TAPPIT stamp affixer.
Cheaper and quicker than a post marker,
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ALL MAKES



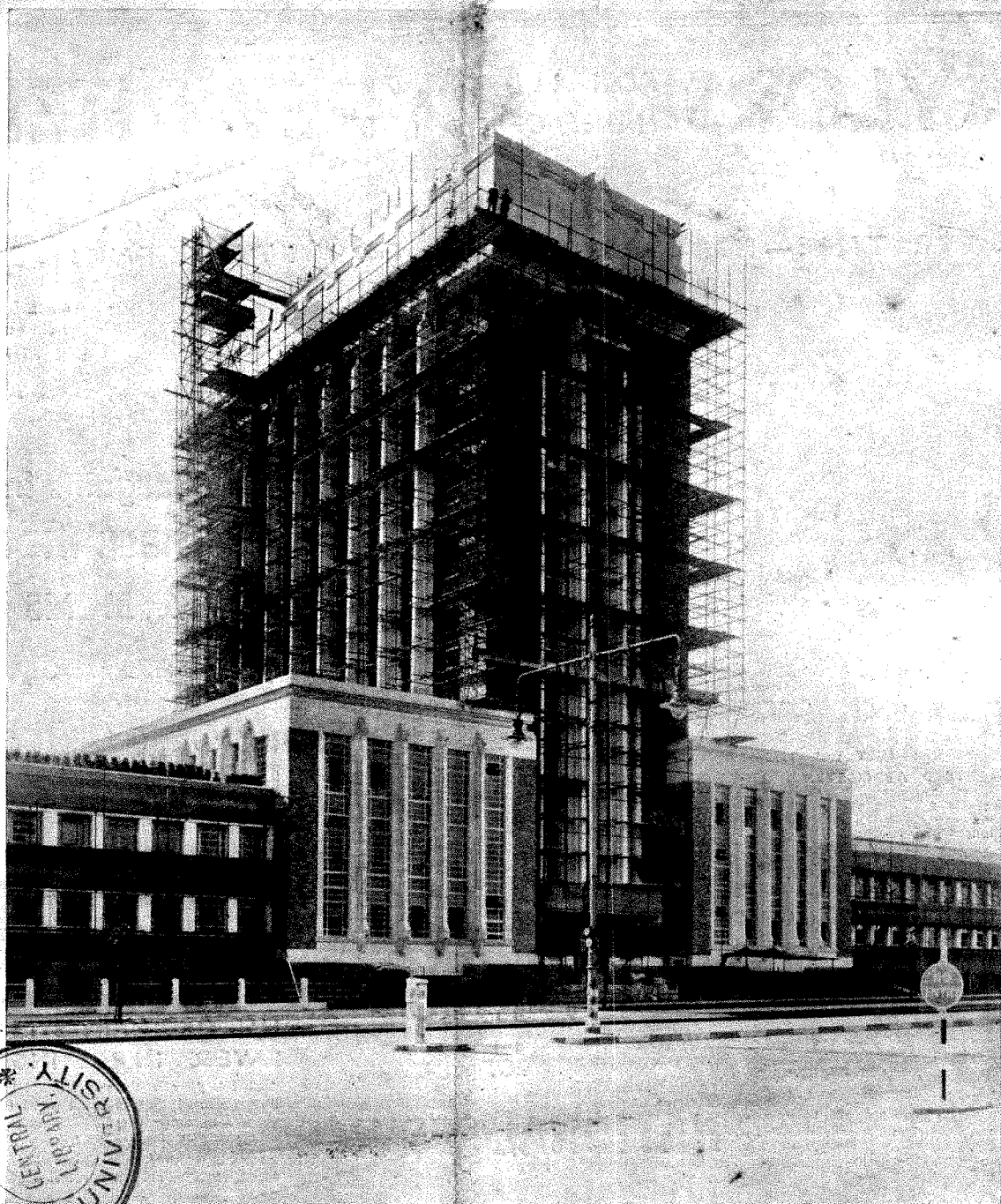
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BUSINESS

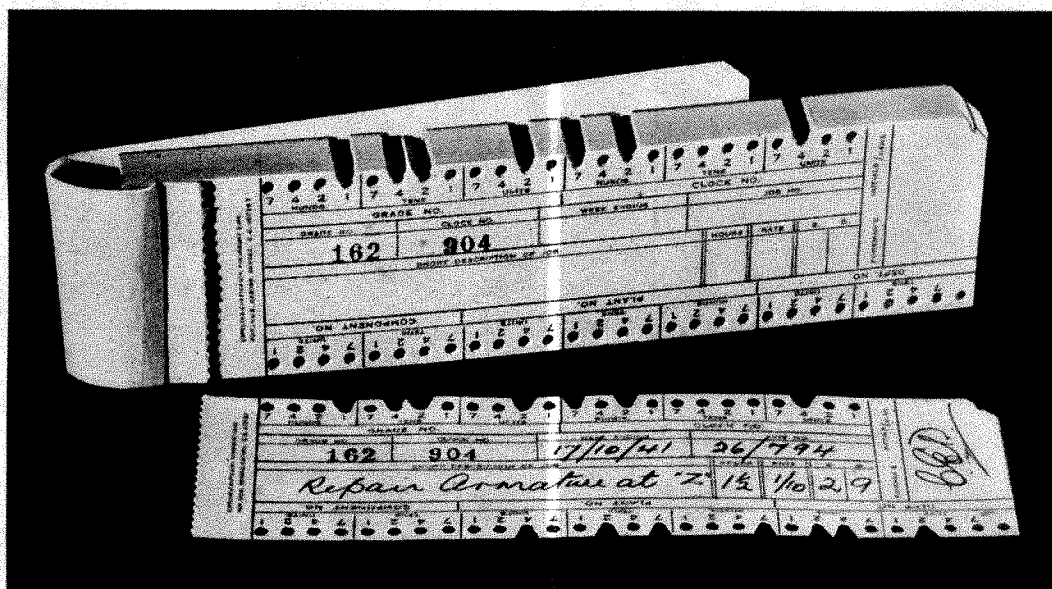
THE JOURNAL OF MANAGEMENT & PRODUCTION



14 Most Successful Means to **STEP - UP OUTPUT**

Results of Nation - Wide Survey
Reducing this "Running Around"

Simplified Progress • Unpunctuality • Wage Payment
A.R.P. • Social Groups • Meal Planning • Ventilation



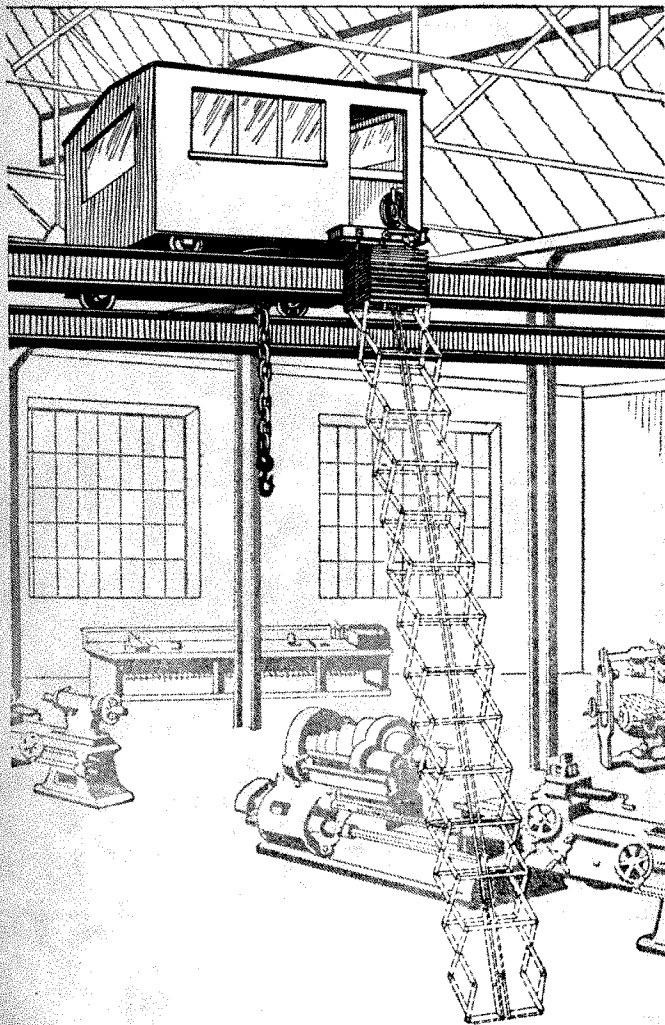
The Paramount Hand Operated Punched Card System is a simple method employing Cards readily understood by director and worker alike. By its use a few junior girls can prove Pay roll figures from finished costs before wage payment. The system applies equally to stores. It promotes easy planning and progressing and is used by hundreds of firms in many industries all over the country.

The cards shown are part of an installation, common to Paramount users, where all the cost finding, allocation of cost to jobs and building up of cost summary figures is done by several juniors leaving the seniors free to apply costs experience to the creation and improvement of standards.

The system will improve your Production Control and will certainly save executive and clerical time and labour. Why not ask for details?

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Suspended from edge of Cab
Dimensions closed 15"x12"x9"

INSTANTANEOUS IN ACTION
STANDARD 14ft.

110/- CARRIAGE PAID U.K.
EXTRA SECTIONS OF 9" 7/6

When current is cut off driver can descend at once.
Ladder remains in position for ascent after "All clear."
As Ladder travels with Cab it is always ready for
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Can be bolted to any other position in the Works or
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Weather-proofed and Enamelled.

A COMPLETE AND PERFECT FIRE ESCAPE.

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Scrap

5th COLUMN SEATING

Which undermines workers health & morale
AND GET 100% OF YOUR WORKERS EFFORT

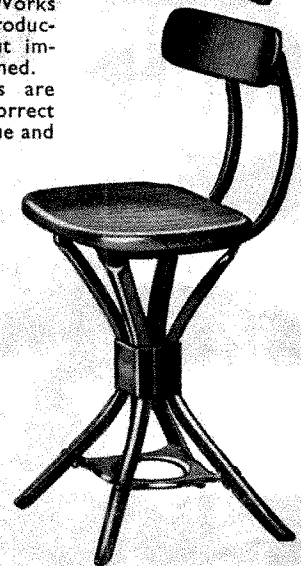
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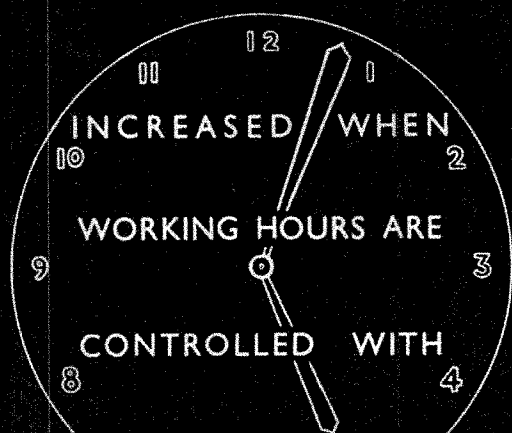
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ONE GIRL

CAN STOP 1000 TANKS!



If the production order is held up on her desk, it's not HER fault! She's buried under a mountain of "paper work" and every time she's called to take dictation, the pile grows larger. The flow of work through the office is delayed.

Such methods have no place in an "all out" defence programme. It takes millions of words to build tanks—to co-ordinate the activities of scores of suppliers, and this mental production must proceed smoothly to keep factory wheels turning.

In ANY business, a production programme is just as vulnerable to delay and error in the office as in the shop. Most offices are

working under pressure. Antiquated two-person dictation, with its time-wasting bottlenecks, can't take the load. The need is for modern methods.

Such is the Dictaphone method. Everywhere, this versatile, modern dictating machine gets ideas into action FAST because it helps to get work done the EASY way. It speeds clerical work, and smashes bottlenecks all along the production line.

Every executive owes it to himself and his responsibilities to investigate the Dictaphone. Write to-day for "Office Methods & Practice" (Free).

Also get particulars of the DICTAPHONE TELECORD. It makes an automatic record of telephone talks and messages and saves congestion on the lines.

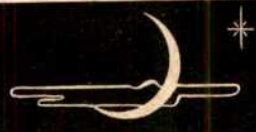
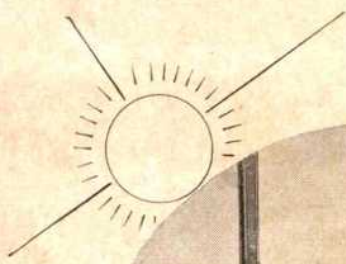
The Dictaphone

(Reg. Trade Mark).

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Telephone: HOLborn 4161 (5 lines).

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Incorporating "The Magazine of Commerce," "Modern Business,"
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By Miss F. Garrett, Canteen Adviser, Industrial Welfare Society	

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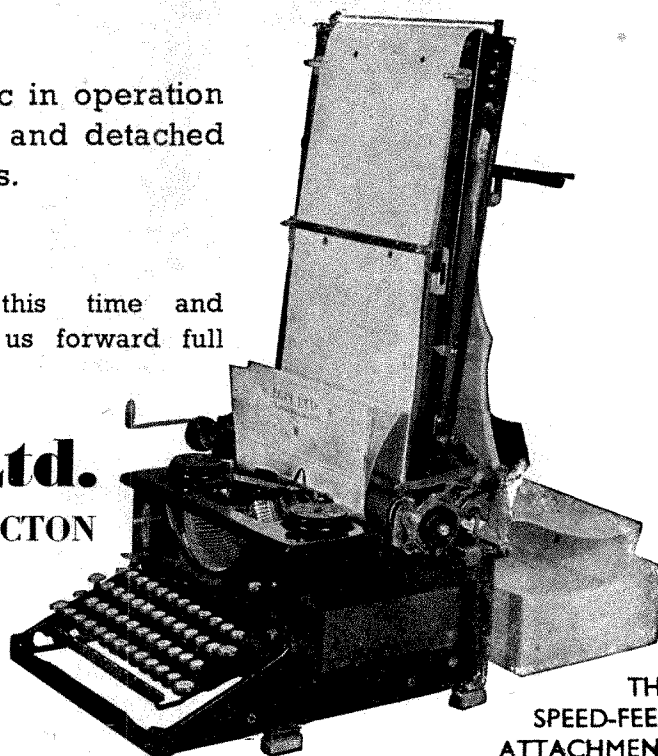
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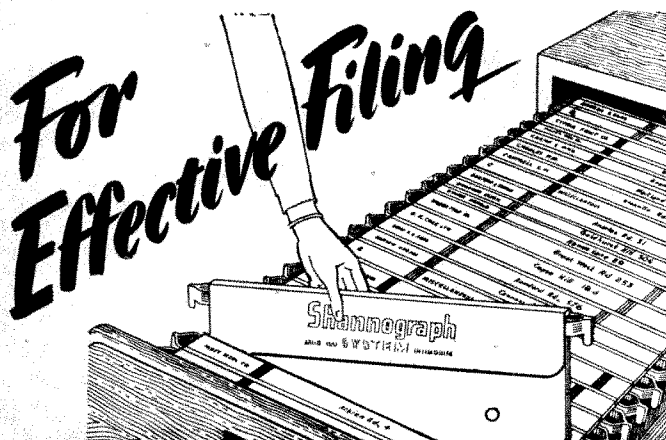
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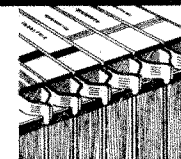
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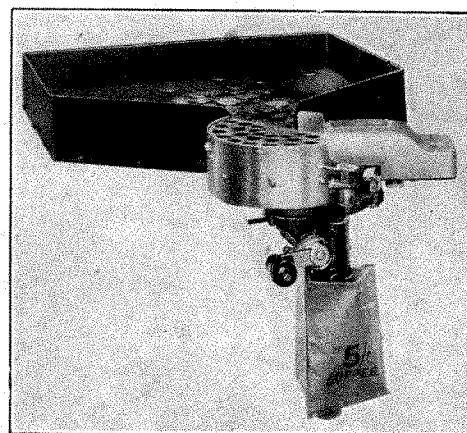
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BUSINESS WAR-TIME PRODUCTION SURVEYS—2

Which of These 14 Methods are Best To STEP-UP OUTPUT?

Important new trends emerge from this survey. Absenteeism is again proved to be an area problem. It is scarcely mentioned in 20% of the returns from firms on civil work. "Chasing materials to prevent shortages" is by far the most successful means of keeping up output. "Closer progress control" comes second. New trend towards a more scientific wage payment method emerges

By CECIL CHISHOLM

BUSY executives read with a wry smile the statement last week by a Government spokesman that the problems of materials and machines are now solved, only the problem of labour remains. This burst of optimism is hardly borne out by the results of our latest survey on the output situation.

Our last survey dealt fully with absenteeism; this time experience of executives in using the fourteen main methods for stepping up output is surveyed.

At the suggestion of many readers, the composition of the samples has been radically changed. Almost 80% of our questionnaires (and returns) are now for factories engaged on war work. These include almost all the important aircraft concerns, a number of the

largest aeroplane accessory manufacturers and a percentage of tank, gun and lorry factories.

On this occasion luxuries (chocolate, confectionery, spirits, cosmetics, fancy goods, tobacco and cigarettes, but not soft drinks) have been completely excluded. One or two of the largest biscuit manufacturers have been included, as biscuits have become a staple of war-time diet.

Care has been taken to include factories of all sizes. While most of the big aircraft firms employing 10,000 or more people are included, a number of concerns on war work employing as few as fifty or a hundred people are included as they still represent so large a proportion of the war output judged by almost any standard.

HOW THEY VOTED

This is how the firms returning our questionnaire voted. 80 per cent. of them were engaged on war production; 20 per cent. were engaged primarily on civil work. The percentages show the total votes cast. Firms were asked to give the three most successful methods in their experience to step-up output.

First choice was given three points, the second choice two points, the third choice one point.

	per cent.
Closer control of wilful absenteeism ...	14.25
Better stock-keeping system ...	2.00
Closer progress control ...	14.75
Alteration in wage-payment system ...	7.25
Better factory lighting ...	9.75
Improved transport facilities to and from work ...	4.5
Better heating and ventilation ...	4.0
Closer control in employment department ...	3.75
Better training of workers ...	7.5
Extended canteen service ...	5.25
Better welfare and medical services ...	5.5
Wide accident prevention campaign ...	1.25
Chasing materials to prevent shortages ...	17.00
Music at work ...	0.5
Any other methods ...	2.75
	100.00

Further, many great concerns are operating small plants for the first time. So the experience of small independent concerns is of great value to directors of large concerns now facing the problems of small scale production for the first time.

Readers will remember that in this journal we have stressed particularly the importance of material chasing, of progress systems and of the control of absenteeism. We have placed such emphasis on these points that they were well scattered on the questionnaire. Chasing of materials was deliberately placed near the foot of the questionnaire, to prevent it attracting exceptional attention.

48% Say that Material Chasing is Most Important

Yet it will be seen that this factor figures first in our returns. As before firms were asked to place the factors assisting in stepping up production in order of importance. The factor marked 1 got three marks, that marked 2, two marks, the third choice, one mark. No fewer than 48% of the firms replying put material chasing among the first three best methods for stepping up output. Nearly 20% ranked it first. This voting came from every part of the country. Aircraft and electrical industries are almost unanimous in making shortage of materials

their first worry and its cure the most direct way to higher production.

The uses of energetic young executives as chasers of material and parts is steadily increasing. In some cases salesmen are on the job, in others progress men have gone out, in some cases the directors are spending a good deal of their own time on this job. We hope to publish further material on methods of easing the problem in early issues.

Why Progress Control is so Vital to Production

Surprisingly enough, "closer progress control" came in second. Here again the aircraft, electrical and armament industries generally are responsible for the bulk of the vote. More and more firms are at last realising that if they know where they are going they will get there quicker. The greater the knowledge executives have of what is happening at every stage of the job, the easier it is to forestall shortages, bottlenecks, and other delays.

When we consider that some of the newest type aeroplanes may contain well over 50,000 parts, the necessity for keeping a strict watch on every individual stage of production is obvious.

At one time the worker tended to dislike the modern progress system. "Too much paper in our place" was a

common complaint, referring to the number of forms to be filled up as to parts required, work in progress and so on. To-day, the intelligent worker is as keen on an efficient progress system as his works director. But many factories have still a good deal of leeway to make in this matter.

In particular there is a tendency not to simplify the progress system as much as is possible when mass production methods are introduced.

An example of just how simple a system can be used for tooling-up is given in the article on page (17) which describes a system successfully in use at a highly efficient works for the past couple of years.

The factor third on the list is "closer control of wilful absenteeism" with 14.25% of the vote.

Absenteeism is Still Holding Up Output in Certain Cities

It is encouraging to find that the control of absenteeism now seldom ranks first in the list of methods for increasing output. There is every reason to suppose that attendance is improving outside the black spots. With better transport, better shopping facilities, better canteens, shorter hours and no Sunday work, the problem has now undoubtedly been eased.

On the other hand in Glasgow, Sheffield, Birmingham, Coventry, it remains the chief problem still. Three directors sent in their individual remedies. Says the Managing Director of a Midlands firm engaged on war work:

"Our best method to step-up output has been the formation of a Works Committee which meets me once a month to discuss complaints, alterations in method, improvements, etc. This Committee has now been running for twelve months and has proved really successful."

The Aircraft Industry Has Still a Big Absentee Problem

Another Midlands concern on war work has an unusual solution for absenteeism. By notifying a girl's parents when she is absent without a doctor's certificate or a specific reason, most of the wilful absenteeism is prevented. "In most cases," this director writes, "parents do not know how often their daughters stay away from work: generally they have no idea that the girl is not at the factory."

Of course, this method will not apply where many of the girls are living away from home. But where the majority of the girls are from the locality, it apparently affords a simple and direct way of reducing the trouble.

Our recent evidence of the local nature of absenteeism and of low capacity working in general is confirmed in this second survey. Almost all firms in the aircraft industry and the majority of those on war work place absenteeism as one of the main prob-

VOTING PUT "CHASING OF RAW MATERIALS" EASILY FIRST

METHODS	5	10	15	20
CLOSER CONTROL OF WILFUL ABSENTEEISM	15	15	10	0
BETTER STOCK-KEEPING SYSTEM	5	0	0	0
CLOSER PROGRESS CONTROL	15	15	10	0
ALTERATION IN WAGE-PAYMENT SYSTEM	10	10	0	0
BETTER FACTORY LIGHTING	10	10	0	0
IMPROVED TRANSPORT FACILITIES	5	0	0	0
BETTER HEATING AND VENTILATION	5	0	0	0
CLOSER CONTROL IN EMPLOYMENT DEPT.	5	0	0	0
BETTER TRAINING OF WORKERS	10	10	0	0
EXTENDED CANTEEN SERVICE	5	0	0	0
BETTER WELFARE AND MEDICAL SERVICES	5	0	0	0
WIDE ACCIDENT PREVENTION CAMPAIGN	5	0	0	0
CHASING MATERIALS TO PREVENT SHORTAGES	15	15	10	0
MUSIC AT WORK	5	0	0	0
OTHER METHODS	5	0	0	0

It will be noticed that "closer progress control" and "closer control of wilful absenteeism" almost tied for the second place. "Better lighting" came fourth. "Accident prevention campaign" and "music at work" secured scarcely any votes

My own impression is that the London blitzes made a profound impression on the working people. Outside Coventry, the impression made by local blitzes is much less deep. Nor have the provincial newspapers been so able in encouraging the "chins up" attitude as the London evenings. The reader may smile but the writer has proved the importance of local propaganda on more than one occasion.

A number of firms mention income tax as a slower-up of effort. I think the general feeling is that to charge income tax earned in the long summer days at a time when the workers are earning less money owing to the black-out and other causes is a mistake. The Government must find a means of postponing the payment of taxation on winter work until the following winter, and quickly. One or two firms in the North regard this as their greatest difficulty in ensuring a steady output.

The only possible conclusions are that (a) the Government's Lighting Order of May last wakened up many directors to the necessity of efficient lighting for the first time; (b) a number of concerns are having to use small shops formerly used for light industries like furniture making, novelty manufacture, dressmaking, which were not well-lit; while (c) there are a number of trades in which the nature of the work does not demand a high level of

METHODS	
CLOSER CONTROL OF WILFUL ABSENTEEISM	
BETTER STOCK-KEEPING SYSTEM	
CLOSER PROGRESS CONTROL	
ALTERATION IN WAGE-PAYMENT SYSTEM	
BETTER FACTORY LIGHTING	
IMPROVED TRANSPORT FACILITIES	
BETTER HEATING AND VENTILATION	
CLOSER CONTROL IN EMPLOYMENT DEPT.	
BETTER TRAINING OF WORKERS	
EXTENDED CANTEEN SERVICE	
BETTER WELFARE AND MEDICAL SERVICES	
WIDE ACCIDENT PREVENTION CAMPAIGN	
CHASING MATERIALS TO PREVENT SHORTAGES	
MUSIC AT WORK	
OTHER METHODS	

In this war wages have been to some extent controlled, partly by the Treasury's demand for close costing, partly by cheaper money and special agreements, but the old difficulty still remains; the skilled worker is underpaid compared with an unskilled worker.

It is noticeable that "improved transport facilities to and from work" comes low in this questionnaire as compared with absenteeism. One good reason for this is the strenuous efforts made to improve these services since the recent whip up by the Ministry of Labour. In many cases directors of factories in the country have at last been able to arrange not merely for the most liberal series of staggered bus services to points near the workers' homes in their

(Please turn to page 34).

Training Plans that Help to Open Man-Power Bottlenecks

DURING the autumn of 1940 the Pioneer Gen-E-Motor Corporation, a small American firm employing only 260 workers, which made electric motors and generators, was faced with the prospect of filling government defence orders that necessitated an expansion programme calling for five times the floor space and three times the personnel. This meant the company would have to move to a new and larger location, install new machinery, increase its personnel to a minimum of 600 workers, and at the same time increase production to avoid contract time penalties.

The company started moving in February, 1941, completed the job by the end of March, and by the end of June had increased its business (orders on hand) over seventeen times in less than ten months. All contracts had been met on time. Over 600 workers were trained in the intricate art of coil and armature winding, assembly, inspection, and machining. Rejects were few and production had rocketed seven times the January figure.

How to Move Without Interrupting Production

The methods used by this company in accomplishing its desired objective, surprisingly enough, were simple.

The first thing this manufacturer did was to contact his local Office of Production Management. The O.P.M., with the help of the training within industry division of the Department of Labour, then worked out a plan of action that the company religiously followed.

Pioneer's factory works manager, attentively listened to the suggestions made by the O.P.M. and the Department of Labour. The onerous job of moving and maintaining production was accomplished by moving half of a department at the time. For example, in coil winding, after the new machines were installed in the new building, half of the workers were transferred to their new location and, while this was going on, the other employees continued their work at the old location. All the departments were moved in this manner without disrupting production.

Skilled Workers Train the Unskilled

As soon as moving was completed, a thorough job analysis study was made to determine exactly how many workers were needed for what types of work and what their training should be.

*By courtesy of "American Business."

Here are some of the methods recommended by the Office of Production Management to help U.S. firms overcome their personnel problems. Many of them may be adopted without alteration here

By J. K. WESTERFIELD*

After these factors had been determined, the more skilled and experienced workers were upgraded in such a manner that each experienced worker trained four unskilled workers. For a period of two weeks production dropped to nil while experienced workers frantically sought to teach the new ones. But once the crucial two-week training period had passed, production began to soar, and it hasn't stopped since.

However, Pioneer Gen-E-Motor has not stopped training its workers. It now conducts courses in blueprint reading and drawing, shop mathematics, and wire handling. And, in order to be sure of highly skilled instruction, they are now training an experienced high school teacher so that he can be on their permanent teaching staff. The works manager estimates that his training programme has cost £25 to £30 per person. The total cost; £25,000 for 1,000 workers.

Some of the Problems that May Halt Production

"The most important thing in carrying out a programme of this type," says the works manager, "is the determination and foresight to carry out your programme. If one way does not work, try another, and another." He points out that more than once his company was threatened with a shortage of raw materials, but usually a word to the O.P.M. was enough to expedite matters.

It is not an exaggeration to say that to-day thousands of manufacturers have found themselves in the same position Pioneer Gen-E-Motor Company was in when it received its first large defence order in 1940. The problems may not be identical, but men must be hired, trained, and materials must be on hand. How can these things best be done? That is the question the author has been working on for the past three months, and here

are the facts that have come from interviewing over fifty different manufacturers.

One employer discovered that the absence of any one of five key men in his plant would so tie up production that he would have to shut down, making 750 men idle. It didn't take this employer long to remedy this situation.

Splitting the Skilled Workers Helped this Firm

In another case an employer wanted to put on a night shift, but he couldn't find enough skilled men. It was suggested to him that he split his skilled force in half and put one half on at night. This would get the night shift started and the skilled workers in each shift could help train the unskilled. To date this plan is working very well.

A perfect example of what can happen when a fresh viewpoint is introduced in the solving of a production problem is borne out by the Government inspector who noticed that a radio manufacturer had both slow and fast girls working on the same production line. The solution to greater production was amazingly simple: Put all the fast girls on one line and all the slow ones on the other. The result increased production 25 per cent. in a week.

Three Ways to Find Skilled Workers

The U.S. Government suggest that employers facing a shortage of skilled labour take the following three steps in order to remedy the situation:

1. *Take an inventory of the entire plant personnel.* This inventory should include each workman's skill even back into his childhood. An example of how this works is illustrated by the following incident: A moving picture camera factory needed a lens grinder. The company advertised in newspapers, contacted employment agencies, and

(Please turn to page 18)

More Ways to Get Office Workers to Start on Time

Unpunctuality can be cured if it is treated as a game instead of a crime

NEXT to absenteeism, unpunctuality is one of the biggest bogeys facing management today. Every other problem fades in significance when it is realised that unless the personnel is there to do the work, no work can be done.

How to get workers to the office on time seems to be a thorn in the side of most office managers. And removing the thorn is not the simple operation it would seem to be.

Unfortunately many of the habitual offenders—people who are late to work several mornings every week—are outstanding workers in other respects. Often the management hates to dismiss them because of one bad habit, but realise that it is difficult to make others toe the mark when a few are allowed to overlook it flagrantly.

Some Objections to Punctuality are Justified but Can Be Overcome

Sometimes, it is possible to sympathise with the attitude of some of the offenders. It is known perhaps, that they often cheerfully work overtime and argue "Well, I give a lot of extra time to my job, so why should the company begrudge me a few minutes now and then when I am late?"

Furthermore, any executive knows that the highest type of worker is usually the type who likes to manage his own time and who never fails to make good use of it. He doesn't like to be subjected to rules and regulations and he resents the insinuation that he cannot be trusted to give his best without supervision.

While we may thoroughly understand these various points of view on the part of most trustworthy employees, the fact remains that a lot of money can be lost in any company where workers are allowed to come and go without restriction.

From surveys made by BUSINESS it seems that two extremes prevail in the methods used to enforce punctuality. Some companies are very lax, while others are very strict. We have found companies where the time-clock policy was so strictly enforced that the gain in punctuality was more than offset by loss in morale. The frame of mind of

the worker, who may have left home in good time but is held up by one of the all too frequent delays in urban transport in war-time, can be understood. Yet there are many firms who will not accept this or any other excuse and penalise the employee by deducting anything up to a whole day's pay.

Don't Dress Down an Employee Before Inferiors

The resentment of an employee, too, can be understood if he is tactlessly called on the carpet before other workers, many of them perhaps holding positions inferior to his own. When it is necessary to talk to an employee about his time-clock record it should most certainly be done apart from his fellow workers. This is a fundamental rule of good management—no one should ever be humiliated or reproached publicly.

The best way, from our investigations, to improve punctuality records is to make the workers really *want* to be on time. Many companies have done outstanding things in that direction. In other words, a pint of praise is usually better than a barrel of reproof. You can set up incentives for better punctuality among your office workers just as easily as you can to increase the output of your salesmen. And about the same technique can be used in either case.

Sales Managers' Boosting Methods Can Help

The best sales managers, for example, say very little in their bulletins about the men who are lagging behind. Instead, they applaud the leaders. By recognising the good work of the men at the top, those at the bottom are inspired to improve.

The same thing will happen when the office manager honours those who have the best punctuality record. If the employees are divided into groups or departments, intergroup races may be run. While this is done, no comment is necessary. You can be sure that the head of a department which has a bad record will take pains to improve it the following month. He knows that punctuality is one of the measuring rods of



his ability as a supervisor. He will be ashamed to see his department lagging at the bottom.

Contests to improve punctuality are just as feasible as those conducted to increase sales. One firm organised its punctuality records on an inter-departmental basis and the symbol of victory was a clock which passed from group to group and stood in a prominent place in the department which had finished first the preceding month.

Perhaps that all sounds like child's play, but it isn't. The workers in the various departments took the contest so seriously that all kinds of incidents began to happen. Workers would actually run to their places several minutes before time—because they *wanted* to be on time. They didn't want to give their group a black mark. Sometimes, when the competition was close, departments would challenge other departments with a side-bet—with perhaps a dinner as a stake.

Promotion May be Held Up for Tardiness

Another method adopted by several firms is to have, as an established policy, a rule under which no man or woman can be promoted or receive an increase in salary unless his or her punctuality record is above a certain standard of excellence.

Other firms have a plan by which any worker who is late has to report to the office manager before going to his desk.

One advisable procedure in handling punctuality records is to clear them all through executive. It may be the office manager, the personnel manager or some other executive to whom the responsibility is delegated. When all records are handled through one man you escape the danger of some supervisors being more lax than others.

Human beings can be made to get to work on time. There is no doubt about that. But punctuality should be a friendly game rather than an arduous task.

MANAGEMENT in *War-time . . .*



The Problem of the Skilled *versus* the Unskilled

FOR one war-time problem there seems to be no conceivable answer. This is the new girl trained by the firm's instructor who would be capable of viewing, inspection, or even more skilled work. But she prefers to take home a heavier wage packet by doing the simplest sort of milling, drilling or repetition work. Hence the continued famine in inspection staff.

The only possible solution for this problem lies in the Government control of wages based on a logical policy. The many suggestions for paying factory workers like civil personnel according to the type of work, skill, length of service, are reasonable. Indeed this is the only possible way out of the trouble. If adopted it would also reduce the danger of inflation.

Meantime can one wonder that the Government's 35 excellent training schools languish. One even hears that some of them may be closed down. It is extremely sad that so many skilled instructors, so much valuable material like the Johansen measuring bricks should be lost. Yet it is not merely employers' stubbornness but the workers' reluctance that is crabbing this admirable plan. A sane wages system would quickly fill these schools.

WHY IS THERE NOT MORE POST-WAR PLANNING

THE number of concerns planning for post-war business is surprising. Thomas French & Sons, Ltd.,

who make tab and webbing for Venetian blinds have now completed their post-war merchandising plans. Singer's Sewing Machines Co. expect the greatest demand for sewing machines the Company has ever experienced. Plans for getting that business are now under way.

Several advertising agents are planning not merely the design, packaging, marketing and advertising of post-war products for some of their clients, but they are even developing a number of plans for recapturing export markets. The best known firm of industrial consultants has also several of its best people at work on after the war planning.

Unfortunately a number of other concerns are thinking in shorter terms. Some executives who should know better are scrapping their entire advertising expenditure simply because the market is presently oversold. Most of these concerns are going to have a nasty awaking within six months of the armistice.

THE "I'LL DO IT MYSELF" EXECUTIVE

DESPITE the need throughout industry for the maximum output per person there are numerous cases of high-up executives who impede the work of others because they insist upon doing so much ordinary routine work themselves. These men are, in themselves, very often extremely capable and essentially valuable men, but they

fail because they have not the ability to delegate work. They want to do it all themselves. When they do delegate a job, they want it done exactly as they would do it or not at all.

"Oh, never mind—I'll do it myself" is the one phrase this type of man repeats over and over again each day when people ask him for instructions. He hires good assistants and because he never learns to trust them, keeps them busy with the pettiest kind of routine jobs when they would quickly acquire ability to take much responsibility off his shoulders. He wants to O.K. every paper, see every report, check all the mail and sign every communication that leaves his department. No wonder he must take a brief case full of work to do at home every night. He could, if he knew how, work less and do more. But he prefers to work more and accomplish less.

KILLING AMBITION AND SELF-RELIANCE

Exceedingly capable department managers realise that the younger people in their department are not as skilled or as experienced as they are. They need constructive suggestions, encouragement and supervision. The manager who insists on doing things himself, rather than helping his subordinates improve their work, will never develop a good staff. In the first place he will lose all the best members of his staff. The aggressive, ambitious, self-reliant members simply will not work under the nagging of an "I'll do it myself" boss. They will leave. Only the weaklings will stay, content to stand by while the boss overworks. Thick-skinned enough to take constant criticism and complaining, they develop an attitude of indifference and stick to the job with knowledge that they can do mediocre work and always get away with it.

The demands made on industry today simply will not permit such wastage of good man-power.

OFFICE EQUIPMENT IS IMPORTANT

AMERICA'S Priorities Control, OPM, has given "dynamic" business machines an A.10 priority rating. Government officials very plainly realise that management tools are just as important to production as machine tools.

A New Approach to Labour Relations—

Why do Your Men Work 30% Below Capacity ?

IN these articles we have described three of the main results of the important twelve years' research* by the Western Electric Company, U.S.A., into employee discontent. We have seen how by segregating five *women* workers in a test room output was increased continuously even when conditions were made much worse: how an entirely new technique of interviewing was introduced and operated to get at the facts in the worker's mind: how a new type of official, the personnel adviser, was appointed for every 300 workers, and what he does.

In this final article, we discuss a test which showed *why* 14 MEN reduced their output. This experience enabled the research workers concerned to develop a fundamentally new contribution to personnel management. This can be summarised in a few words.

Unofficial social groups are a compelling factor in determining output in the modern factory.

At the outset, the output situation in three large groups of workers in the factory was studied. In every case it was found that output was anything from 20% to 30% below the capacity of the workers.

How Certain Charge Hands Influenced the Workers

In the first group every man and girl was satisfied that they would not be satisfactorily paid for any extra effort over what they called the "bogey." (This was the rate of output determined as reasonable by the management). Most of the work was shared out in the morning so that everybody could "take it easy" during the late afternoon.

The unofficial leader of this group was one of the two charge hands who had worked at the bench in the same shop for many years. He was determined to be popular—and was. His one aim was to secure plenty of work for his group and to protect their interests at every point. The others lacked ambition and initiative. At most one or two were interested in improving their position. Sometimes they spoke of the department as an "old people's home."

Said one worker: "The fellows get in here and don't seem to want to get

This final instalment of our series of articles describing the important and unusual investigations carried out at the Hawthorne Works of the Western Electric Company reveals the unwritten code of behaviour of certain groups of workers which is largely responsible for low output

away. Take a fellow like me. I have been on this job for ten years. If I was transferred I should have to start all over again and I should have a pretty rough time."

A congenial and happy-go-lucky spirit pervaded the shop. Newcomers described the group as a "swell bunch of guys."

In the second group studied the unofficial leader was a fairly steady workman of strong character. Only one of the workers was brilliant. He was detested by the entire group. The harder he worked the more he was disliked. If the unofficial leader tried to equal this worker's record, he usually failed. The same thing happened to other workers. This led to an intensified dislike of the clever workman. His mates became convinced that he was a "sissy." As a result he was generally dispised, his nickname being Mary Lou.

The charge hand made this situation worse by setting him to do certain operations in order to test whether the other workers were slacking.

British Factory Conditions Often Resemble this U.S. Plant

On the whole this group was satisfied with conditions.

In the third group there was a good deal of general dissatisfaction and unrest. There were continual demands for promotion or transfer.

Yet no effort was made to increase output. In fact this was limited by everybody to a figure just below the bogey, easily obtained even when machines were running poorly.

This group had two leaders. One acted almost as a shop steward. He

knew how to deal with engineers, instructors, charge hands and even foremen. For he was an exceptional workman in addition to having a gift for stating a case. In this section the charge hands were unable to improve either output or quality. They passed round the quality charts and records for the men to see but made no effort to improve the situation. "Hands off" was their motto. They said quite frankly that they had to leave their men alone.

In all these three cases, the supervisory control set up by the management had little authority except to ensure that workers were supplied with material, parts and machines.

The reader will agree that this describes the normal situation in the average British factory, except for spurts such as those after Dunkirk, after a Churchill speech or after a local blitz.

This Bonus Scheme Maintained an Even Output

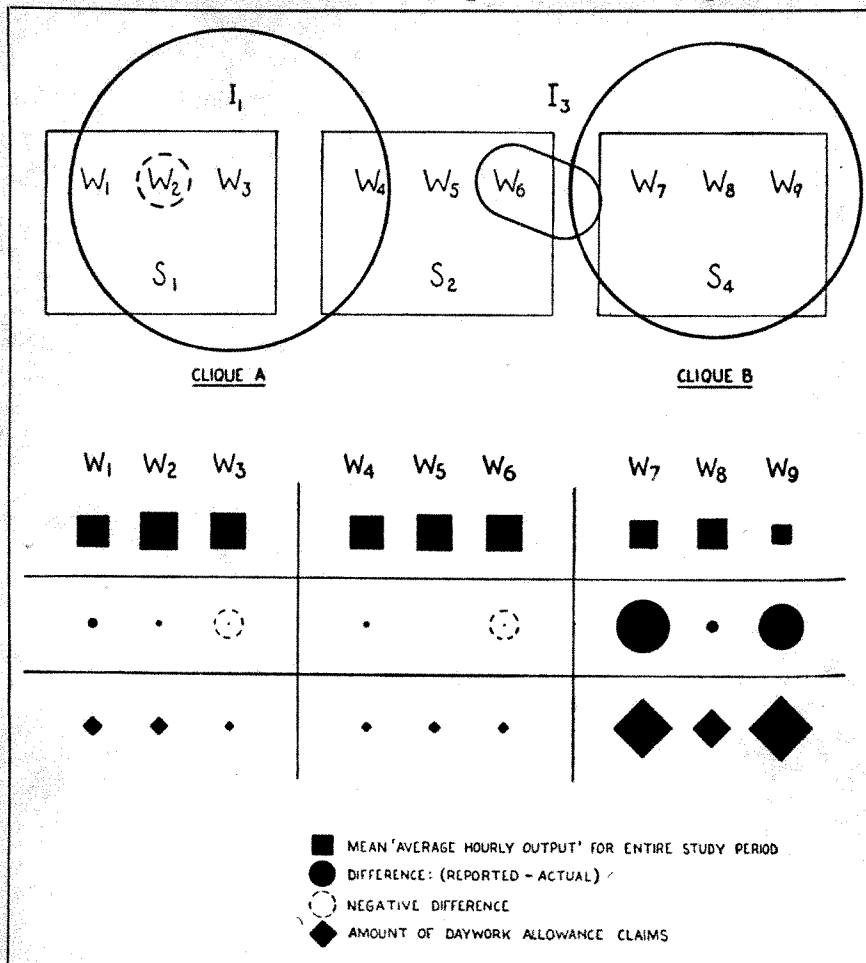
It was determined to study the situation more closely by segregating a group of men engaged on the fairly skilled work of bank wiring. Fourteen men were chosen for observation, typical of their department in age, physique, skill and experience.

Payment was continued on the normal system in the works. Each worker was paid a time rate based on his own past performances, and participated in group bonus based on the total number of banks wired in four weeks and added to each worker's pay envelope at four, weekly intervals.

The test period lasted from mid-November, 1931, until the end of May,

*"Management and the Worker," By E. J. Roethlisberger and William J. Dickson (Harvard University Press, U.S.A.). Both the Management Library and the Institute of Industrial Psychology have a copy available for loan to members, otherwise the book must be obtained direct from the American publishers. Ed.

How Unofficial Social Cliques Re-act on Output



The two large circles show the main social cliques. These do not follow the official lines of organisation into three soldering groups. Nor do they follow the lines of rank or position. Inspector of first soldering group is a clique member, inspector of third soldering group is not. Notice that the individualist W2 belongs to no group whatever.

Below is shown the real output of each of the nine wiremen. It will be seen that some of the best workers like W2 report having done more work than they actually do, although this is commoner with the least capable workers like W7 and W9 in clique B. It will be noticed that the two best workers W2 and W5 belong to neither group, that neither fakes his output figures.

(Courtesy of Harvard University Press, U.S.A.).

1941, just over six months. Output neither rose nor fell to any serious extent.

The group of fourteen workers was divided into three groups, each consisting of three wiremen and one solderer, with two inspectors covering them all. The bogey was fixed at 6,600 connections, there being 3,000 connections on a set. It should be explained that the use of a bogey in this way is not used for rate cutting. Indeed rate cutting is forbidden.

Seven Points of Behaviour that Lower Output

Observation of this group proved conclusively that this behaviour was the same as that of the workers in the shops.

- (1) Each individual in the group restricted his output.
- (2) The workers fixed for themselves a figure well below the bogey to which they were supposed to work.
- (3) The individual rate was not

precisely on this unofficial bogey line but either a little above or a little below it. But each man's output curve remained constant.

- (4) Departmental output records were distorted in two ways. There was a difference between actual output and reported output and there was a difference between standard working time and reported working time. Stoppages were lengthened where they actually occurred, they were invented, they were brought about by the operator himself and where there was a genuine stoppage, no effort was made to work a little harder to make up.
- (5) Inspectors actually rated a worker more on their personal opinion of the man than on the quality of his work, and their ability to rate at all varied greatly.

- (6) The most intelligent and dexterous workers often produced the lowest output. Indeed output has no relation to the results of intelligence and dexterity tests.

- (7) Everybody stopped work before knocking-off time, particularly the fastest workers.

The situation in the bank wiring room was therefore identical with that in the average shop.

How much light does the experiment show on why every worker restricted output, wasted time, and most put in more stoppage time than actually occurred?

Obviously the incentive of the group bonus was not operating. Yet the workers were not really sticking to their own unofficial conception of a reasonable day's work. What was behind their attitude?

Behind their attitude was a series of important inter-personnel relationships. First there was the relationship of rank. The two inspectors were in a class by themselves. The connector wiremen ranked socially above the selector wiremen. Both men were doing the same work.

Work and Position in Shop Affects Outlook of Workers

Further, the connector workers happened to be seated in front of the selector men. As they acquired proficiency the men at the back would be moved forward. Their rates tended to be higher than those of the others. In front were the élite.

Yet connector workmen and selector workmen were more closely on equality than wireman and solderers, for the solderer actually served the wiremen.

So it was the solderers who got most of the kidding, who went for the lunches, who did the running about for the others. In six months of observation of this group not once did the wireman forgo the lunches or even order them.

The second relationship was that of position. The workers tended to fall into two cliques, a front of the room clique and a back of the room clique. The precise nature of these cliques is shown in the chart above. The groups played their own games together in spare time and off time, had their own collective bets on football and racing. In a word, each was a group of friends.

Membership of the clique depended on obeying a certain number of unwritten laws. These sentiments related usually to occupation, output, supervision. They ran as follows:

- (1) You should not turn out too much work. If you did you were a "rate-buster."
- (2) You should not turn out too little work. If you did you were a "chiseler."
- (3) You should not tell a charge hand anything that would react to the detriment of an associate. If you did you were a "squealer."

- (4) You should not attempt to maintain social distance or get officious. If you were an inspector, for instance, you should not act like one.

These unwritten laws explain why certain members fell outside their logical groups. Inspector 1st was hard, efficient and ambitious so he was carefully excluded from the second clique. Worker W had a high output. He was proud of that output but he was also an isolationist. In fact he used his output to express his contempt for his mates and the group. So he was consciously an isolationist. But it does not appear to have affected this fellow's spirit!

W was the only man in the second soldering group to be accepted by Clique B. Why was he not accepted by Clique A, his logical plan? He was a good worker and he did more to help his mates than any other man. He obeyed the unwritten laws, so he should have been popular. Unfortunately he had two vices in the eyes of his mates. He was too fond of horseplay, an inveterate practical joker. He lacked tact, also he was ambitious for leadership of the group. Leadership in a shop group never passes to a rough diamond of this type and his search for it annoyed his mates.

Why the Average Worker Joins a Group

It will be seen that, given the code of unwritten laws, the formation of set groups was inevitable: that the position of each worker in his own group was also inevitable: and that the social group was used as a defence by the workers against both management on the one hand and technologists on the other.

To-day the average worker feels himself menaced by both. Management may cut rates or fail to supply material or make changes which may affect one's comfort. The technologists may devise a new method for doing the job which either changes one's work or one's shop or one's pay. Finally, the worker knows less to-day than ever before about why changes in rate, method or equipment are made by management and expert. He believes that he has less say in such things than ever before. In the case of a large concern this is probably true.

The Social Group is Workers' Answer to Managerial Pressure

Incidentally the social status of a job is always menaced by changes of method and the social status of a job is extremely important to the modern factory worker. The group always aims at fighting to maintain the status of the people in it.

Therefore the social group is the workers' answer to this pressure. As will be seen above, it was an effective answer at the Hawthorne plant. (It generally is in British factories also).

For it determined output, determined the behaviour of foremen, charge hands and investigators; provided a defence against management interference at every point.

The odd thing is that half of this defence was unnecessary, for the monthly group bonus system was devised precisely to avoid the necessity for limiting the day's output. It should have tended to make the workers think in terms of a month's work rather than a day's to induce the carry-over of work from one day to another. It may be that the average worker prefers to think in terms of a day's work with every incentive to think at a longer range.

Further, rate cutting was not practised at the Hawthorne plant. Indeed it was not allowed. So that output in

this great factory was affected not by conditions of work there but by the general conception of management practice up and down the United States.

The same thing is true in many a well-managed business in this country. But the Union is a greater safeguard for the workers against the rate cutting here than in the United States. On the other hand the influence of the unofficial social group is just as strong here as in the United States.

This influence has never been seriously studied over here. It is to be hoped that the Hawthorne experiments will encourage similar work in many British factories. Certainly every director of a business can cull an idea or two for his own work from these researches.

(Concluded)

How Colour Helps Sales and Production

Stimulation of Work and Appeal is possible if the Right Colour is Selected

THE head of a large firm of butchers was sceptical when told he could increase sales by changing the white walls of his shops. But a colour expert showed him that the impact of those white walls on the eyes of the customers created a grey after-image. This robbed the meat of its natural redness. And as for the time-honoured sawdust on the floor—if you look at yellow long enough other objects take on a bluish tinge.

The solution was simple. The hue that exactly complemented "good beef" colour was blue-green. This was recommended for the walls of the shops because its contrasting after-image accentuated the redness of the meat. For the floor green sawdust was prescribed.

The new colour scheme worked like a charm. The old grey film was gone. The meat leapt forth on the eye of the buyer in rich pinkish red, and the fat and bones took on added whiteness.

How Colour Helps to Sell Food and Stationery

Restaurants also have found colour a valuable ally. One doubled the sale of its salads by serving them on green plates instead of white, creating the illusion of bigger and green salads. Warmer colours, however, are more effective than blue or green in a restaurant to sharpen the appetite and loosen the purse strings.

Surgeons are using colour in the operating room. In a number of hospitals white has been supplanted by bluish green. Surgeons and nurses wear blue-green smocks and masks. This complementary hue of walls and smocks spares the surgeon's eyes during

long periods of concentration under bright operating room lights. "Men in white" may soon be an obsolete phrase.

Recently a manufacturer of office stationery ran off an experimental batch of pale-green ledger paper, with rulings of soft brown and dark green instead of the time-honoured red and blue. Book-keepers found that the new paper cut the glare of reflected light, and that the new rulings were less "jumpy."

Colour Can Help to Save Factory Accidents

About twelve years ago the head of a shoe manufacturing plant was inspecting his factory and talking with the workers. A middle-aged machine operator complained that he had been having headaches and blind spots. The manufacturer looked at the black finishing machine and at the black shoe in the workman's hand. The line of demarcation was hard to see. He had an idea. "Go down to the paint shop and pick out a bright, pleasant colour. Clean your machine and paint it."

Other workmen asked permission to paint their machines and before long the plant was a rainbow run riot. Shoe machines bloomed in jade, rose and orchid. And with the new contrast between leather and cutting edges, there was less fatigue. The accident rate fell off by nearly 70 per cent. and fewer damaged shoes were thrown into the seconds bin.

When he saw the result the factory manager called in a colour expert and worked out a permanent scheme for his plant. Stationary parts of the machines were painted buff, moving parts light green. Colour has prolonged the working life of hundreds of people.



Internal broadcasting sets similar to this will solve many executives' perambulations

How to Keep Men at their Desks

Modern Inter-communication Equipment will save much time in War-Time Offices

WHETHER he is a clerk or the managing director, nearly everyone likes to walk around the office to visit other departments. If the walking seems to be necessary, it is an even more inviting release from routine work or thinking out a solution to a problem that calls for a decision.

This walking about can easily become a habit. It's a time-consuming and expensive practice. The total wastage of time, assessed at even a low rate, will amount to many hundreds of pounds a year in even a medium-sized office. Fortunately, science has come forward with a solution which makes it practically unnecessary for any man, whatever his position, to leave his desk once he sits down to his job. Modern communicating equipment is designed to keep men at their desks even when they are attending a large conference.

Not More than 5% Should Be Walking instead of Working

Here's a little plan that has been effectively used for years by a management consultant. Count the number of people walking around in the principal office workrooms. If it's over 10 per

cent. of the number who work in those rooms it is practically certain that modern communicating equipment will result in worth-while savings. Of course, the count should be made several times and the results averaged. It's surprising in how many offices over 10 per cent. of the pay-roll hours are spent in walking instead of working. In well-managed offices, handling enough routine work so that the test is a fair one, this sort of check often gives results as low as 5 per cent.

A Check on 'Phone Calls Will Show Need

How do the more alert companies begin a study of the communication problems with which we are concerned here — those of communication over wires? One of the first steps in such a study is often the "traffic count." This is made on sheets ruled into one-inch squares. Both at the top and along the left side are listed the telephone stations. Each time a person calls another a check is made in the appropriate square. "Outside" calls are indicated by a distinctive mark. If there is at present a manually operated

switchboard the calls can be counted by a girl sitting by the operator. Sometimes workers are required to count their own calls.

Of course, any such count must be made over a long enough period to include periodical peaks. Such a count of calls is only part of the study. There must also be observed what use is made of messenger service, what messenger trips are made personally by individuals, and — very important — what mistakes and delays occur because the means of communication are too slow or are non-existent. Often single routines require special study; a teletypewriter or telautograph installation may take the place of a long-established procedure.

Separate Internal Circuits Will Solve Many Firms' Problems

One of the special uses of the telephone which is often overlooked is the conference circuit or connection of more than two people in the same hook-up. When a sales manager wants to tell all his branch managers of an emergency price change he can talk with them all at once, wherever they are. Whether or not it is less expensive depends on how the branches are stretched out in straight lines across the country, but it saves time and insures that all receive the same announcement. Similar conference circuits can be arranged on interior systems.

But perhaps the solution of your communication problem does not lie in use of the exterior telephone even with the flexibility of these switching devices. Separate interior telephone systems are used in many companies. These are principally of two types. One is operated from a small cabinet on the desk. This type has a microphone in the cabinet. The second type consists of dial telephones similar to exterior telephones but operating on a separate automatic exchange.

Group Conferences May Be Held at one Time

The type of interior telephone that operates from keys in a small cabinet has no central exchange. All of the equipment is contained in the several small cabinets. There are two types of instrument. The one for executives has a microphone and a loud speaker. It is not necessary to pick up a receiver: the person calling merely touches a key and talks. The second type of instrument—often used for others than executives—has a similar key cabinet with a French type telephone instrument that rests in a cradle on top of it. A system may be made up of any combination of the two types of instruments.

This sort of communicating system has several special advantages. It is easy for executives to use it. Instantly several departments may be consulted, either simultaneously or separately, while holding an outside call or dictating. (Please turn to page 36)

This Simple Progress System Does Speed Up Production

YOUTH has its value. We have often thought that an advantage of having been established rather less than a quarter of a century is that our management has been able to conduct our affairs almost entirely in accordance with the technical requirements of a machine industry without being impeded over-much by antiquated principles.

This applied even before the war, but with our entire plant now solely on work of national importance we have been able to scrap even those methods which do not appear to be adapted to war-time conditions. In particular we have developed the use of three principles of management which too often in the past have been more honoured on paper than in practice.

The Three Essentials that Make this System a Success

These management principles are simply:

- Getting the essential facts under the eye of the top responsible executive at high speed so that immediate action can be taken from above.
- Breaking down authority into self-contained sections, each one having a job within its own capacity, and with authority to carry it through.
- Keeping continual check that every individual and smallest section is working to capacity and is holding schedule as nearly as is humanly possible. This is the chief principle.

To show where we have cut out unnecessary records and routine, let us follow an order through the organisation from receipt to production.

How Materials for Production are Ensured

1. The first information issued on a new job is the *sales release* dictated in the sales office and sent to the heads of each division concerned. The release shows that a certain job has been acquired, gives general information regarding it, the rate of production and delivery date required. We find such a simple advice extremely helpful in enabling our executives to think ahead on such questions as materials, lay-out, tool programme, etc.

2. A few days later a detailed *production order* is issued from the sales office which gives authority to the shop concerned and to the buying division to:

- Plan for the production of the work.
- Plan for the purchase of the material required.
- Plan for the delivery of the material as required.

With authority broken into self-contained units, this system of checking brings reports of schedule breakdowns to the notice of the responsible executive in the shortest possible time

By an Executive of a large Midlands Engineering Concern

Soon after the issue of this order, the chasers will be at work in the factories supplying raw materials, parts and accessories (if any). Admittedly, the securing of raw materials is perhaps the biggest snag to-day. At the moment we have five resident buying executives chasing materials up and down the country. Actually we appointed our first resident progress man in the Midland counties away back in 1933. To-day the team does invaluable work in avoiding shortages. It is doubtful whether any firm of moderate size could afford to be without enterprising and resourceful young men chasing material shortages daily and almost hourly.

3. The production office plans dates for each stage of the job. Every stage

of the work is estimated most carefully by the heads of the sections concerned.

Even on the most urgent job margins must be provided for contingencies. Delays will occur, there are shortages of materials, labour, or there is a change in design. The most efficient management cannot exclude these dangers. All it can do is to deal with them at the earliest possible moment.

Shop Foremen Have an Important Role to Play

4. The lay-out department is advised of the precise details required for the new order. It must find the space required in one of the shops for the mass production of the job. Naturally it plans most carefully—it will fit one job in with another with the minimum loss of time and factory cubic space.

As soon as possible every foreman and charge hand is issued with a parts list and production procedures. These tell him exactly the material required, the tools to be used, labour he will need.

More important, the foreman concerned is able to see the lay-out men and the planning engineers from the moment they start work on the new lay-out. Through watching these men at work, through contact with the buying office they know everything about parts, operations and the general lay-out of the job long before they have to get down to it. The foreman also gets copies of the instructions for operations, drawings and even of the lighting arrangements.

A Simple Document Provides Efficient Master Schedule

5. Weekly progress meetings are held to co-ordinate, direct, and control all these activities. The important document before each executive sitting round the table at the progress meetings is a master tool schedule of each job being discussed. This is a very simple document and is shown in the illustration. Every unnecessary detail has been eliminated but we find that schedules got out in this way work splendidly. Obviously, the production of

MASTER TOOL SCHEDULE			Date.	Notes.
Design	...	...		
Tool Planning	...	...		
Tool Design	...	...		
		Dies		
		Jigs		
Blank Sizes	...	...		
Metal	...	...		
Die Patterns	...	...		
Die Castings	...	...		
Die Machinery	...	...		
Die Try-out	...	...		
Stampings	...	...		
Floor Lay-out Design	...	...		
Ready for Production	...	...		
Jig Machining to Start	...	...		
Jig Try-out	...	...		
Sample	...	...		
No. of Dies				
"	Die Patterns			
"	Jigs Pieces			
"	Assemblies			
"	Stampings			
"	P.O. Parts			
			Works Manager.	

This form produced at each Works Conference gives all necessary information to permit planning and progress to be controlled at every stage

dies and jigs for a large job is bound to encounter delays, checks, and hindrances from stage to stage and there is much plain speaking at these meetings, the works director being in the chair.

Often enough the only remedy for delays is ingenuity; the courageous use of substitutes wherever possible; improvisation by both hand-made tools and hand work until supplies come along. Normally we are able to keep fairly closely to our schedule.

It is Vital that the Foreman Knows Everything

When recently a steel producing area was blitzed we had the same frightful trouble as everybody else with tool steel. For a time we kept three men on the spot on nothing but chasing steel. In such a case we have to call on the traffic manager who can cut hours and days off transport. He must get the stuff here in record time. And he does.

By the time the dies are built the foreman has learned everything about the nature of the job. We regard this as vital.

So far every detail has been worked out under the eye of the production manager. This executive has all these jobs on his production schedule. He will call for samples of the new job on a certain date.

Store Control by Finance Department Ensures Efficiency

6. Following delivery of these samples, the production manager will schedule on a production basis. At this stage a series of disconcerting discoveries may appear to complicate the job. An operation may be difficult for unskilled labour with the jigs and tools proposed. This may entail engineering changes that might threaten to hold up production but at all costs production is kept going, possibly by the use of skilled labour in the experimental division.

A vital small part may be unobtainable in sufficient quantities. A versatile foreman will be given a shop order and asked to do what he can with it. As a result he may make some little tool and knock up several of these parts to enable us to carry on. Again, the buying department must work night and day on improving the sources of supply.

Fortunately none of our executives are men who say "it cannot be done." We are still young enough to feel that nothing is impossible.

7. We have always regarded store control as one of our key problems. From our earliest days we took the unusual course of putting the stores under the control of the finance division. As a result the issue of materials and parts is done on a strictly numerical basis. In other words, if the production department wants 500 of a certain job, the stores only issue exactly 500 units of the materials and

parts required. No margin for waste is allowed. If a single piece of material or a part is lost, damaged, or destroyed, the foreman must indent for a new one on what we call a "scrap ticket." This gives us complete control of scrap in the shop as well as complete control of the stores.

Further, the storeman issues the material direct to the line. Each individual storeman has his own individual section which he comes to know by heart. He issues goods only to the schedules of the production office. Personally he is held responsible for seeing that the ordered material gets to the lines on the one hand and that the unissued material is in the bins on the other. This creates an atmosphere of responsibility.

This System of Control Shows "Red Light" of Shortages

This system also enables us to simplify stores records. Instead of a continual return of stores, we simply ask the chief storemen for a *daily shortage list* which is collated and issued to the management by the chief storekeeper. This simple form shows only parts and materials in short supply, the quantity left in the store, the number required per job and the

number of days that the store has already reported this shortage.

The system gives management a series of red lights on coming shortages. It creates goodwill among the storemen who are proud of their stocks and records. The plan shows very quickly what is going wrong and we have much more time to get action which may not be easy in these days.

Endless Clerical Work is Eliminated

We get our inventory on the bin cards and check it with the financial buying record, i.e. the financial inventory. We have therefore a complete double check. Under this system we use bin cards as issue cards. No foreman is asked to initial endless tickets for materials or parts. This method has an important advantage. It reduces the possibilities of error and it gives the foreman more time for his proper job, getting output.

Of course, this system is not perfect but we find that it saves us an endless amount of clerical work, that it speeds up the discovery of shortages, difficulties and errors, that it distributes responsibility more widely, all of which we have found to be helpful in getting the best and most efficient production.

Training Plans that Help to Open Man-Power Bottlenecks

(Continued from page 10)

generally searched high and low for a man who had this rare skill. After several weeks it all but gave up finding such a man when a clerk in the shipping department stepped forward and said that back in Austria he had been a lens grinder, could they use him? He had heard his own company was looking for a lens grinder through plant gossip. Needless to say everyone is much happier now.

Spare Time Occupations are Guides to Efficiency

Hobbies are also very important. Don't neglect to ask your men about how they use their spare time. One large Chicago plant discovered that many of its office staff were model builders with complete workshops in their basements. Many of these men are now holding important production jobs.

2. *Pick out good teachers* to work with management in the training of men. A good teacher must be a natural leader, and he must enjoy showing others how to do his job. Some workmen are reluctant to disclose what they

call "trade secrets." These men should never be used as teachers.

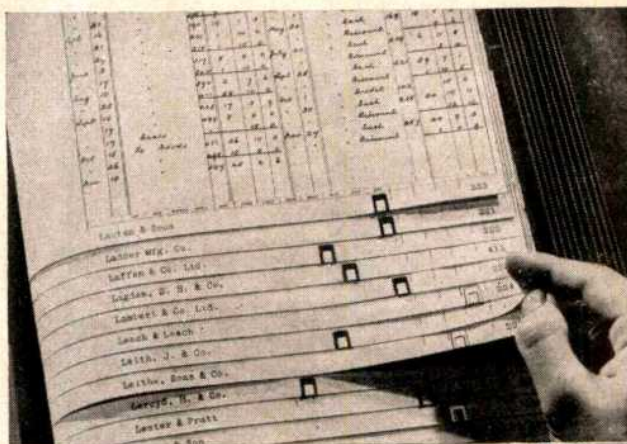
3. *Keep adequate records of those who apply for work.* During the last six months many a skilled worker has been located through almost antiquated but complete personnel records. One manufacturer found a tool maker who came to him ten years ago in search of work.

How to Overcome Personnel Shortages

All personnel men agree on one point which is that the shortage of skilled workers is nothing now compared to what it will be later this year. Then there may even be a shortage of labour of any kind. To mitigate this situation some companies are checking over the records of college graduates to locate long lost engineers who have drifted into other fields. A once-famous engineer was found writing juvenile fiction stories. Another engineer was about to be drafted into the Army, because, for the last ten years, finding engineering jobs difficult to find, he drifted into the millinery business.



...in both cases the same principle...



When playing cards, you don't put them one behind the other. For easy reference and selection you fan them out so that the titles of each are visible.

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NORTHFIELD • BIRMINGHAM 31

The illustration shows three overlapping payroll forms. The top form is a 'sheet of workers' dockets' with columns for employee names and various numerical data. The middle form is a 'payroll sheet' with columns for employee names, rates, gross wages, deductions, and net wages. The bottom form is a 'typical worker's record' with columns for employee name, date, rate, gross wages, deductions, and net wages. The forms are perforated for separation.

All these forms are produced at one writing. In the centre is the payroll sheet, behind at the top is the sheet of workers' dockets, with two slips detached, while bottom right is a typical worker's record

This Payroll System Gives Us Complete Check on all Records

Manifold Production of Wages Book, Worker's Docket and Record Safeguards Accuracy

By EDWARD A. BACON,
Secretary, Thexton & Wright Ltd.

JUST over 12 months ago we realised that the growing number of deductions from employees' wages and salaries, both voluntary and compulsory, were adding a substantially increased burden on our Wages Department. Since this section was already depleted in staff owing to the call of the Services it was obvious that some new method of wage control would have to be adopted if substantial overtime was not to be incurred.

After exploring various ways of meeting new conditions imposed by the war we decided to adapt to our needs the peg board method which would permit us to produce the wages book, pay advice slips and, if we needed

them, individual records on one entry. The preparation of these records by one writing, especially since the new forms we proposed to employ contained all the necessary columns for gross and nett wages, rate, worker's clock number as well as for employee's deductions and employer's contributions, would obviously save us considerable time.

The peg board we use for the actual writing of the records is precisely the same as that employed for ledger, journal, cash book and general accountancy record writing. The wages book or payroll record is a form which when completed is inserted into a loose leaf binder and becomes our permanent wages book.

As will be seen from the illustration this contains 17 chief columns. These are in order, the number of hours worked: the rate: gross wages: employee's deductions (health and unemployment insurance, voluntary savings, income tax deductions and total): nett wages: employer's contributions to national insurance: the week number: the worker's clock number: checking column and the name of the worker.

Precisely the same information is given on the pay slips which are produced at the same time. These slips are perforated ready for separation and are an exact copy of the relative line of the wages book and, therefore, show the employee exactly how his wages have been calculated. By this means, we are able to avoid any dispute which may arise—as so frequently happens when the preparation of pay advice slips or details of wages involves a separate writing operation.

Complete Check on Future Alterations is Possible

As I explained above, at the present time we keep a separate record of the payments to each worker, but these forms again are precisely the same in their recordings as the actual pay roll record which becomes our complete wages book.

The chief advantage of these individual records is that they permit a whole half year's figures to be given on one sheet and we are therefore able to record in advance any changes that may have to be made in the future in insurance contributions or in actual money to be paid. Thus we are able to check against the appropriate week's number the date when a girl becomes 16, 18 or 21, with corresponding alterations in her health and unemployment payments. Also if an office worker is going on holiday at a certain time and is to be paid two or three weeks' salary in advance a pencilled entry on his or her record will ensure that when the actual payroll is being prepared the fact that this extra week's salary has to be allowed for will not be overlooked.

Full Details of Income Tax Payments are Kept

Also on these individual records are full details of income tax deductions. Further lines are allowed for notes and assessment particulars.

A further advantage which we have found with this system is that we are able to produce a complete second set of records on the peg board at the same time as the master copy is made. This, of course, is only a war-time measure necessitated by the possible destruction of records by enemy action. This second set can be removed to a safe place immediately the payroll has been prepared and involves no more labour than that taken by putting an extra sheet under the master copy and involves no extra cost beyond that of the extra paper used.

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Sumlock Times	
Find the number of standard Rods of brickwork in a wall 52½' long 8' high, 2½ bricks thick	7½ Seconds
274 ozs. (avoid) @ 2/- per gramme plus 2½%	8 Seconds
7 cwt. 1 qr. 2 lbs. @ 30/3d cwt.	2½ Seconds
Find the cubic capacity of a rectangular block of wood 26' 6" long 9' 8" wide and 4" thick	3½ Seconds
8,053 articles @ £14.19.11d per 1000 less 5% less 2½%	7 Seconds
Convert 332 Rupees 10 annas to £.s.d. when rate of exchange is 1/6d per rupee	1 Second
Jan-June, 1940, figures-£8,876.0.0	3 Seconds
Jan-June, 1941, figures-£10,798.0.0	
Show percentage of increase	

SUMLOCK
*Adding-Calculating
Machines*



How to Prevent Material Waste in Industry

Workers Must be Taught What Waste Means

By WALTER BOND, M.I.A.E., F.I.R.I.,*

Dunlop Rubber Co. Ltd.

WASTE avoidance must get accepted as a normal part of operation so that it hardly needs thinking about any more. Once the technique becomes habitual you cannot lose it even if you want to. . . . It is part of the normal business of management to keep it continually under observation.

It is wrong to assume that all waste is preventable by the operative workers. In a well-organised factory management should ensure that his opportunities for doing so are very limited.

Assuming that the management has done its part, then is the time to enlist the co-operation of the workers. Firstly a survey of the situation must be given. This can be illustrated by pictorial statistics—showing for example that the avoidable waste of, say six months, is equal in weight to so many loaves of bread, or is equal to so many man hours of work that it would make a Spitfire.

Specimens and information can be exhibited in well-illuminated show cases placed so that operatives will see them as they pass in and out of the factory.

Weekly Anti-Waste Conferences Pay

We have shown the operative the problem, we have told him the necessities of the case, we have asked for his help, and we have provided for awards, if necessary. The next stage is to get the management's ideas down through the whole chain of the organisation until the operative worker is reached. In Fort Dunlop it is done in the following way. Each week the works director holds a meeting with all his executives to deal with all problems of operation and development. The executives include technical, production, planning, cost, engineering, A.R.P., legal and patents, architect and building, equipment and methods, research and laboratories, personnel and labour, and interfactory liaison. Quite a formidable "brains trust".

If at this meeting ideas and a policy regarding waste are generated, this will require direct action by the production superintendent. He will call the usual meeting of all his departmental managers; the policy will be explained and a plan for action formulated. Then each departmental manager will call a meeting of what are called "departmental representatives". They are operative workers elected by their fellows by secret ballot in the shop itself. The representatives will express their views and be put in possession of all the relevant facts. In due course each man will transmit these to his constituents—the operatives whom he represents.

No single person in the organisation can then say he is ignorant. Thereafter the item or plan is not lost sight of. Week after week and at meeting after meeting it is reported upon as required and soon it should become a normal part of the working programme, needing only review and modification from time to time, and on a basis of mutual understanding.

"Economy-Conscious" Executives Help to Find Salvage

By H. H. LONGMAN,*

Assistant Office Manager, Lever Bros. and Unilever Ltd.

MY first hint is that you should keep a complete list of every idea on waste prevention which you can obtain, go through the list periodically and make sure that wherever possible you have put the ideas into operation. Go over some of the old suggestions received in peace time which were turned down then because they were not paying propositions—today the position may be changed, one or two may be winners.

In the Purchasing and Storage Department the first essential is that the authority for requisitioning raw materials and pledging the company's credit should be in the hands of a limited number of "economy conscious" officials. In addition, careful records must be kept, materials repaired, and re-used to the fullest extent. The Buying Department could often make more use of the second-hand market.

Seven Ideas for Saving Paper and Waste

1 An appeal is made to office managers to hand over any old ledgers and account books for which they have no further use. The insides are invaluable for paper making, while the covers can have the leather stripped off, and be sold for fertilisers. The cardboard is used for making boxes and shell cases. One has but to consider the weight of these ledgers and account books to realise the quantity of valuable raw material they contain.

2 Old linen collars and other similar garments have considerable scrap value as the basis for making bank notes.

3 Salesmen and others who normally leave visiting cards wherever they may call, can contribute to the paper saving campaign by asking the reception clerk to return their cards to them, once they have been announced.

4 Old business cards need not be wasted. If a man changes his job, he can get a printer to delete the old address and print the letters "P.T.O." on the face of the card, while on the reverse side can be printed "Now with Blank & Co."

5 Scraps of burlap and buckram are first class ingredients in the making of paper.

6 Grease from old gloves such as used by munition workers can be extracted. If the glove is good enough it is put into use again; torn gloves or those too far gone are sent to the paper makers after the grease has been extracted.

7 The blackout has brought into use a tremendous number of electric batteries, thousands of which have been thrown away after the charges have been exhausted. Now, however, every particle of these dry batteries is made use of. The zinc is re-made; the wax is recovered from the top and used again; the metal is recovered, as also is the paper, and it is made into an entirely new battery.

There are dozens of Salvage Points in Every Department

With manufacturing processes only generalisations are possible, but the aim should be to avoid inefficient setting up of machines; unessential lines; the finishing of materials which had flaws in early processes; careless stacking of fragile material; unnecessary use of power.

In packing materials amongst the different methods for reducing waste are reduction of thickness of cartons, boxes, etc., of the number and size of nails, quantity of wire and the recovery of used containers.

In a large concern prevention of waste of stationery merits the temporary appointment of a good man with creative ideas. In the canteen careful ordering and cooking, an eye on the pig tub, the use of spare land for canteen space will reduce waste.

You Must Not Keep Anti-Waste Ideas to Yourself

To keep a good anti-waste idea to yourself is equivalent to helping the enemy. Small savings should not be treated as "chicken feed" by managements; British industry has lost much by this attitude in the past.

British industry is at present going through the severest test in its history. We are a wasteful nation, possibly our once easily earned prosperity made us so, but whatever the cause very few English industrial concerns have tackled the prevention of waste with anything like the thoroughness its importance deserves. It is a paramount part of our duty in the national war effort to see that waste in industry is cut to an absolute minimum.

*Both these papers were read at the Industrial Welfare Society's Conference on Avoiding Industrial Wastage.

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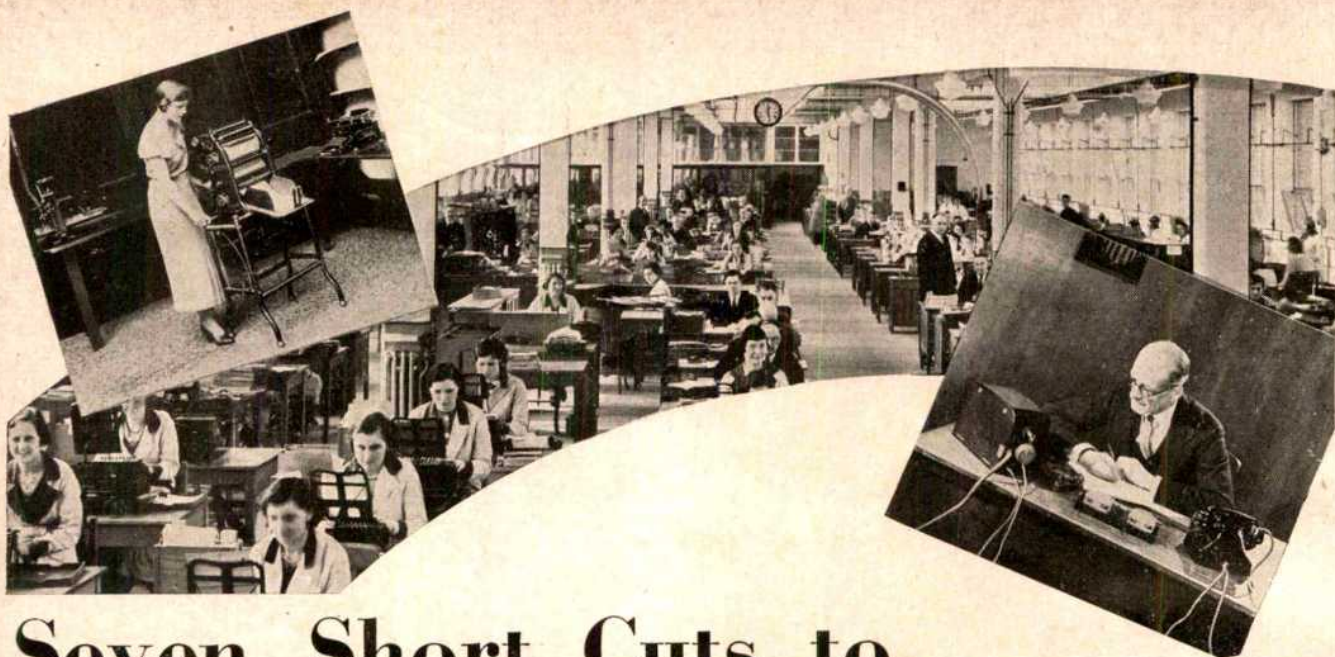
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Seven Short Cuts to Office Efficiency and Economy

Profiting By Financing Employees' Study

TO enable their employees to study and so become more valuable one company arranges to pay the whole or part of the cost of various business courses for them. If the employee passes grade "A" at the end of the term the entire tuition is paid by the company; if grade "B," 75 per cent. of the tuition; if grade "C," 50 per cent. If the employee is lower than grade "C" he pays the full cost. Both employers and employees are enthusiastic over this.

Clubs as Incentives to Morale and Workmanship

ONE large company, which maintains an office force of six hundred, has found it worth while to encourage honorary clubs in several of the larger departments. One of these clubs has been in existence for twelve years and membership is highly coveted. Members are elected secretly on the basis of some outstanding contribution beyond their immediate job, and only four may be chosen each year.

Telephone Operators Start the Day Right

TELEPHONE operators of one company start the day right in answering telephone calls by saying "Good morning!" in response to all incoming calls received until 10.30 a.m. As a result, morning callers carry on the conversation in a cheerful vein when they are connected with the man they wish to reach.

Bringing Catalogues Up To Date

WITH the present restrictions on paper usage many firms are finding it impossible to bring their trade catalogues up to date. Since, however, there has often been a surplus of old catalogues left when new issues have been printed, one firm has overcome the difficulty by printing a small flyleaf which is attached to the inside of the front cover.

This announces that prices mentioned in the main body of the catalogue are now cancelled and new prices stated on the leaflet are now in force.

There is a secret initiation ceremony, and the names of all members are placed on a brass plate which hangs in the department. Company officials claim it is the greatest force for good in the department. Another interesting organisation in the same company is the Straight Thinkers—a group of about forty of the younger men who meet once a week to discuss company policies and their own careers.

Another Use for Office Address Systems

MOST office broadcasting systems are used chiefly for purposes of paging executives who wander away from their desks. A company however, has a system of more than three hundred loud speakers located in every nook and corner of its big building, even down to the boiler room, which is used not only as a

call system but as a means of delivering inspirational broadcasts as well. The system is operated from two microphones, one placed in the telephone office and the other in the managing director's private office. Periodically the managing director or some other executive broadcasts a seven-or ten-minute inspirational talk that reaches every employee in the plant. These talks are devoted chiefly to letting the employees know of the progress of special sales drives, to developing spirit and enthusiasm, to disseminating news about departmental activities, office functions, etc., and of course special news items of war interest.

Chasing Executives Through a Factory

TO reach executives who are away from their own departments one firm has installed an indicator board at the door of each section. This board, measuring about 18 in. by 12 in., is laid out in squares and each square bears the name of a department and is fitted with a small hook. At the bottom of the board is a space for a number of metal tabs of distinctive colours—one for each executive in the department. When any executive goes to another department he places his tab on the appropriate hook, thus making it easy for anyone to find him.

This Stock-Keeping Scheme is Effective

SOME wholesalers keep detailed perpetual stock inventories, whilst others leave stock-taking over six-monthly or twelve-monthly periods. One firm has an unusual arrangement which they have found in practice works remarkably well.

Now many houses with a stock of goods comparable with theirs—they carry something like 50,000 items—keep the lines much more closely to demand. It is necessary to keep stocks down in order to maintain a satisfactory rate of turnover; yet stocks cannot be incomplete, for completeness of stocks is one of the firm's great trading advantages.

So they employ counters instead of bookkeepers. The counters make a physical count

of goods as often as necessary. There is about one counter to every two buyers. In season, goods are counted much oftener than out of season. At this time of the year, stove pipes and so on are selling rapidly because it is the winter season; they are being counted often to make sure that the buyers will have enough, but not too many. Some other kinds of goods, for which the demand at the present time is slack, are not counted nearly so often. Counters do this work at a tremendous saving over the cost of keeping perpetual stock inventories. Besides, errors are bound to creep into paper inventories occasionally; and an erroneous perpetual inventory is simply no use at all!



A challenge to
TRANSPORT USERS

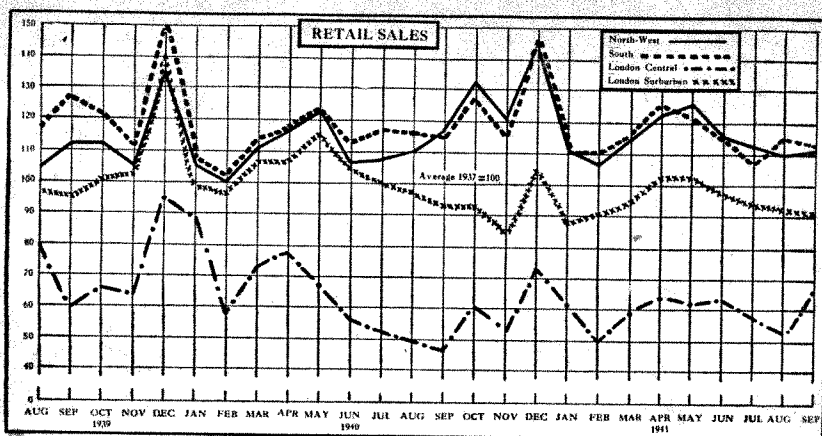
To move munitions, to distribute food, to clear imports promptly, Britain needs at least 100,000 extra wagons and lorries. They can't be built, but they can be found—by you.

HOW?

By tightening up your organisation from office to loading bay, to get a Quicker Turnround of the wagons and lorries you use; by reducing delays between arrival and unloading; by installing every possible labour-saving

device, improvising if you must; by inviting suggestions from the men on the job; by making the fullest use of your powers of planning; by fearless unorthodoxy if needs be. But you must ACT NOW.

WORK FOR
Quicker Turnround
SPEED UP LOADING AND UNLOADING



This chart shows the vagaries of shop sales in four of the principal areas of the country since the outbreak of war

TREND OF TRADE

Area Shop-Sales are Becoming Stabilised

Says CECIL CHISHOLM, M.A.,
Business Consultant

REPORTED changes in the trend of business are merely superficial. The underlying trend is unchanged. Central and West End London shop sales may look spectacular but the figure compares with those for the blitz month of September, 1940. Wholesale prices have at last turned downward but the decrease is slight and probably temporary. The main trend is steady towards further contraction of civil business and expansion of war production.

A fall of 4.2% in total shop sales in September probably represents an actual fall of 35% in the sale of commodities. But in the month of September, 1931, shop sales were at 109 (1937=100); in the blitz month of September, 1940, they fell to 103; last September's figure was 99, representing a total fall of at least 40% since the outbreak of war.

Most startling rise in London shop sales was the near doubling (92.4%) of household piece goods sales, the rise of 90.5% in the fancy departments and of nearly 50% in the furniture departments total sales.

When allowance is made for the fall in price, however, and for the low level in sales in September, 1940, the rise is not so dramatic. Still, a rise in total sales of 44.9% over last year, is encouraging, since the rise in the

cost of living since last September is only around 12%.

Sales in other areas remain steady. Yet suburban London shows a fall of 4.2%. Scotland, the N.E. coast and the Midlands also showed falls of 8.2%, 7.9% and 7.2% respectively, chiefly in non-perishables.

Shop Sales Figure Reveals Success of Government Control

Roughly speaking, the levelling-up process as between the provinces and London has stabilised itself. London sales are still definitely on a far lower level than those of the provinces, compared with the prosperous year of 1937. Sales in Scottish shops are now running around 119, in the N.W. 115, in the Midlands 118. In Central London they are but 68%, although in suburban London they reach 90, compared with a national level of 99, within 1% of 1937.

Cost of living index still hovers between 199 and 200. At the moment the wholesale index has registered its first decline since the war. The index of average wage rates remains astonishingly stable. It is 128½ (December, 1924=100) which is only 8½ points ahead of October, 1940, 14½ points ahead of October, 1939, a total rise of 22½ points.

On the other hand the nett increase in weekly wage rates this year amounts to £1,500,000. The fact that shop sales have fallen by 4% since 1937 is evidence that the Government's main controls are more successful than those used in the Great War. But until a ceiling be put to wages and rationing is extended, an increasing amount of inflation is inevitable.

Some Facts About Our Reduced Export Trade

A few facts about our export trade have leaked out from one source or another. Our exports to America are well below the 1940 level. In July the decrease was over 30%. On the other hand American exports to Britain for July reached a record figure (\$128,771,000), an increase of over 25% on July of last year.

Sales of cotton yarn are running 40% below a year ago. Exports of piece goods have fallen by over 12%, grey goods alone holding their own. It looks as if Lancashire had found a native market in Africa for its cheap lines. Dyed and printed goods also hold their own fairly well.

But improvement in rayon fabric exports has been steady throughout the year. During the past quarter rayon yarn export reached a new height. Since last quarter, supplies of rayon yarn for export have been cut to allow for more urgent domestic needs: so that we may look for a fall in the next quarter. On the whole, the general trend is obvious. Our export trade in staples is generally down by anything from 40% to 50%, while exceptional industries like rayon, pharmaceuticals and woollens are holding their own only so far as they can get materials.

Concentration is Needed in Banking and Insurance

The concentration drive is now at an end. Before the war the insured workers in the industries affected numbered around 1,000,000. In the industries subject to the Limitation of Supplies order the number had dropped from 555,000 in June, 1940, to 460,000 in April, 1941, when the work of concentration began.

It is estimated that the number of people producing controlled goods for the civilian market has fallen from 156,000 in April, 1941, to about 100,000 after concentration. The number of factories has dropped from 4,000, of which 1,400 employed less than 20 persons, and were excluded from the order, 950 were closed and 650 are either on Government work or not covered by the Order for some special reason.

Thus factories over the minimum size on civilian work have been reduced by over 60%. The number of workers released for war work is estimated at 149,000 or about one-fifth of the total labour force. Superficially

(Please turn to page 38)

OUTPUT IS HIGHEST WHERE WORKERS ARE HAPPIEST

—and smartly-fitting overalls that don't shrink contribute more to the well-being and efficiency of employees than many factory managers realize



A group of cruiser tanks nearing completion in the assembly shop of a factory somewhere in England. More tanks, more guns, more planes are needed but output depends a great deal on the well-being of the workers. If they are restricted by tight, shrunken overalls they cannot give of their best.

MORE guns, more tanks, more planes are imperative. And the worker must produce them. Still more output is demanded of every man or woman in the factories.

But with the best good-will in the world the worker cannot always give his "total effort." Women workers need to look their best to work their best. And men and women alike must have comfort and freedom in their working clothes if they're to go "all out" on the job.

DANGERS OF SHRINKAGE

That's why factory managers in these times can't afford to let their workers wear overalls that shrink. A shrunken overall can impede movement and tire the wearer, thus limiting his output. It also gives inefficient protection, may be the cause of accidents. And, in addition, it costs extra money in the long run because it wears out sooner, needs replacing sooner.

Nowadays many of the biggest employers of labour both in factories and institutions are

insisting on "Rigmel"-Shrunk cloth for workers' overalls and uniforms. "Rigmel" - Shrunk overall cloth can't shrink by more than a negligible fraction of an inch per yard however many times it is washed. "Rigmel" is laundry-tested shrinkage. In fact, the British Institution of Launderers say of it, "If the public can be persuaded to insist upon a "Rigmel" guarantee, there will be no more trouble through the shrinkage of cotton fabrics."

Why not put your workers in smart overalls that will always keep their fit and comfort? The staff will look better and they'll work better and output will benefit. All good suppliers can quote you for "Rigmel"-Shrunk overall cloth or you can buy ready-made protective garments in small quantities from retail outlets.



"Rigmel"-Shrunk Laundry-Tested
REGD against Shrinkage

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Industrial Production Equipment

Ventilation Can Alter Output

PRODUCTION can only be maintained at the high level now demanded of it if all workers are mentally alert. All too often factory buildings have been designed with ease of manufacture as their main attribute. The comfort of workers has not been considered, even such simple matters as ventilation.

The productiveness of a worker is in direct proportion to the fitness and general well-being of that worker. Only efficient ventilation can guarantee that the worker will be fit to carry out his or her job, provided of course, that all other means to ensure maximum output are present.

Ventilation is an involved problem. It is the only one which varies with the seasons. And the effect of seasonal weather upon the productivity of industrial workers has been proved time and again by the researches carried out in recent years.

Seasonal Variation and Temperature are Important Factors

These researches have all agreed that no matter what the industry or trade, its production is constantly varying with the month of the year. In practically every case, the maxima of efficiency is present in the spring and autumn with the minima in winter and summer.

Further direct evidence of the immediate relation between air temperature and efficiency is furnished by other experiments recently carried out. In these tests, groups of men and women of all ages were placed in factory positions, in specially constructed experimental rooms. They were given physical and mental tasks of various kinds, and in some experiments they were served with a standard lunch while in the work room and their appetite measured by the amount of food eaten. Exhaustive physiological observations were made on their bodily condition and their efficiency in both mental and physical respects was accurately measured.

Warmth is No Hindrance to Intellectual Work

These experiments showed that stale re-breathed air containing twenty parts of carbon di-oxide and other substances commonly present in such air had no obvious harmful effect on any of the physiological conditions studied, nor on the power or inclination to do mental or physical work.

On the other hand, warm air, whether stale or fresh, produced distinct and clearly marked physiological reactions, indicating a progressively less efficient condition of the circulation with increasing temperature.

Day and Night Use of Factories vitiates the Air and Lowers the Output of all Workers. Efficient Ventilation alone is the cure for this Factory Bogey

The power to do either mental or physical work when concentrating for a short period under a strong stimulus was not diminished in these experiments even by the extreme condition of 30 deg. C. (86 deg. F.) with 80 per cent. relative humidity. This coincides with practical experience, for we are all aware that heat, unless very extreme, is no hindrance to absorbing intellectual work, and no bar to a good game of tennis.

Heat Affects Will Before Power to Work

The effect of heat upon efficiency, unless the influence is a prolonged one, is exercised rather upon the will than on the power to work. Subjects in some cases were asked each day to vote as to the comfort of the conditions in the experimental room on a scale of five points ranging from 1—very uncomfortable to 5—very comfortable. The average votes for five experiments indicated in each instance, that 20 deg. (68 deg. F.) condition was most appreciated, and the warmer and more humid atmosphere became progressively uncomfortable. The difference between 20 deg. and 24 deg. was scarcely appreciable, however, in these records of conscious discomfort. Yet even this range of temperature, produced a distinct difference in the demeanour. At 20 deg. the observers' notes are full of such qualifying phrases as "a playful, energetic good work, inclined to 'rough house,' hard to control, less drowsiness than usual"; while at 24 deg. we find such notes as the following: "sleepy, eyes smarted, less inclination to work, lifeless, drowsy, more conversation than usual."

Heat Even Stimulates Certain Types of Work

The real effects of air temperature upon efficiency were brought out by a series of "option tests" in which the subjects for a given period were given a choice between physical or mental work, on the one hand, and idling on the other, receiving a small cash bonus if they did the work. This is an condition which approximates the actual conditions of school and industrial life, in furnishing a real but not an overmastering stimulus to

effort, with the alternative possibility of taking life more or less easily.

Even this form of option test did not disclose any harmful effect of the 24 deg. C. (75 deg. F.) condition on purely intellectual work, such as mental multiplication. On the contrary, the average of three series of experiments with 47 different male and female subjects, extending over a period of sixteen weeks, showed that 4.9 per cent. more mental multiplication was done at 24 deg. than at 20 deg. It may be that work of this kind offered a certain distraction under slightly uncomfortable conditions and it is also possible that the subjects found the 20 deg. condition too cool for purely sedentary work.

Temperature Changes Affect Mental Activities

It may be noted, however, that when the temperature was changed abruptly in the middle of the day slightly more mental multiplication was done at 20 deg.

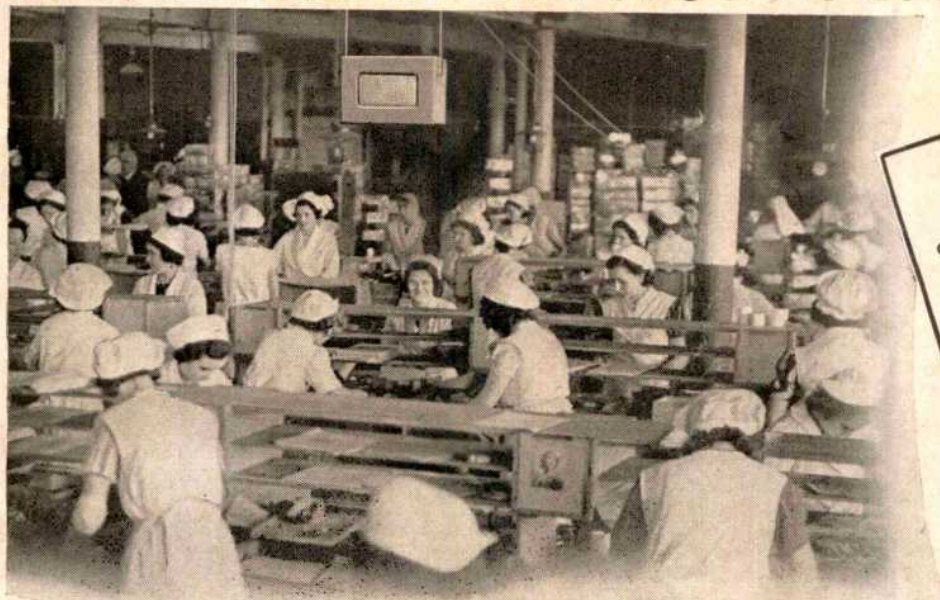
The results of experiments on the effect of air temperature upon optional work cannot of course be directly applied in a quantitative sense to work under factory conditions. The subjects were permitted to remain entirely idle if they chose. On the other hand, they had a slight but distinct money incentive to accomplish as much as possible, while the factory operative, if not employed on piece work, has ample opportunity to work at somewhat less than maximum efficiency without any loss as a result.

High Temperature Produces Disinclination to Physical Work

The experiments cited furnish very clear evidence that a temperature of 24 deg. (75 deg. F.) produces a marked disinclination to any form of physical work, even such light work as typewriting. It can hardly be doubted that this disinclination actually results under factory conditions in a definite decrease in output; and if such is the case the problem of securing adequate factory ventilation and taking other steps necessary to prevent over-heating is one of vital importance to all who are interested in minimizing fatigue and increasing production and should be dealt with at once.

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(b) attempt to call the Brigade?
(c) tackle one job at once?
(d) deal with bombs first or fires?

JUST HOW MUCH depends on the answer given by your fire fighters on the spot? Will they make the right decision and save a burnout, or will there be no premises, and no production, to-morrow? Neither sudden inspiration nor plain common sense will provide the right answer at the critical moment. Only training and practice can do that. Has your staff had the necessary training . . . so that each individual is an effective and confident fire fighting unit?

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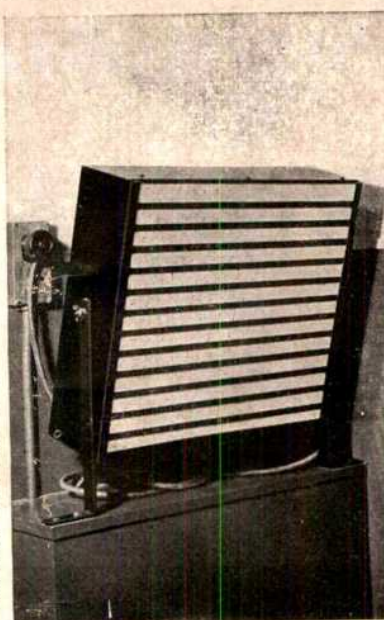
The visual task of inspection may involve continual discrimination of small detail, fine lines and minute surface scratches under conditions where the light is specularly reflected into the operative's eyes.

The type of lighting desirable for this work is one which gives an illumination on the work of 15 to 25 foot-candles from a source of low but even brightness, having an area preferably greater than the area under inspection, and so placed that its image is viewed by the operative with the minimum amount of movement of body or work.

Four popular methods of using electric light for this inspection work are:

- (a) A large area of diffusing (preferably flashed opal) glass suspended over the workbench and evenly illuminated from above by boxed-in lamps. If pearl lamps are used, flashed opal glass will be evenly lighted if the spacing of lamps is equal to the distance of the bulb centres behind the glass.
- (b) Local indirect lighting in the form of a canopy with a white under-surface, illuminated evenly by means of one or more lamps mounted obliquely beneath it, so arranged as to prevent direct

A typical reflector lamp is shown on the left, while the effect of the barred light on an uneven surface is clearly marked in the right hand photograph



- (c) lighting reaching the work.
- (c) A smooth matt white surface (perhaps part of a wall) may be illuminated evenly by reflectors placed in any convenient position. The article to be inspected is then held in front of this and the reflected image of the white surface observed.
- (d) This system is similar to the first, but the surface is vertical instead of horizontal.

In methods (a) and (b) the plate is tilted towards the operator, while in methods

(c) and (d) it is tilted away from him, until, in each case, the image of the luminous or illuminated area covers the work. Scratches and flaws then show up as dark lines or spots against a white background.

For the examination of surface flatness of polished or semi-polished surfaces such as tinplate, methods (a) and (d) may be used. If parallel dark lines are painted across the glass, these dark lines will appear wavy or distorted when viewed by reflection from a plate having an uneven surface.

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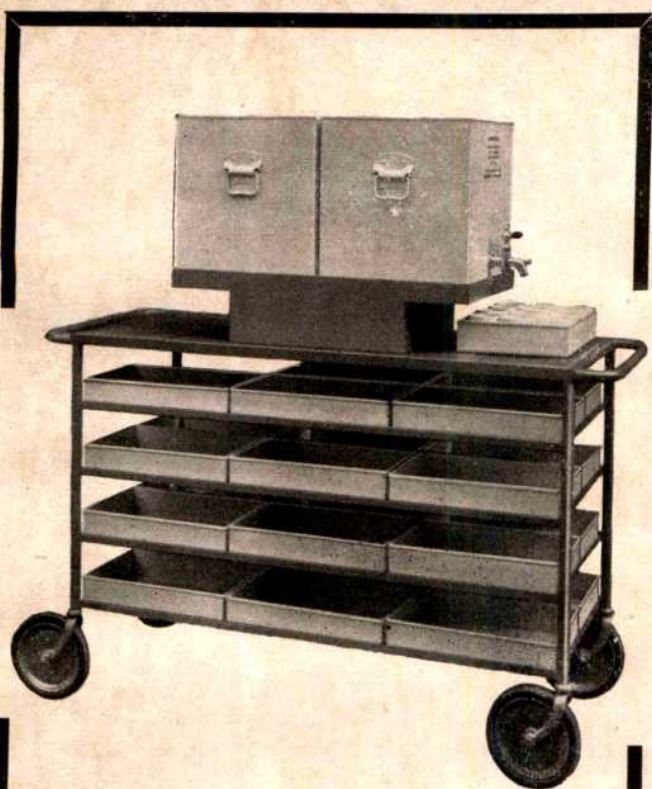
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**32 NEW PROTECTIVE
FACTORY WALL DESIGN**

"Recent developments in protective wall design for factories" is the title of a recent memorandum issued by the Clay Products Technical Bureau of Great Britain.

"It is not practicable to apply strengthening methods to existing 13-in. baffle walls," states the memorandum, "but where it is considered that the personnel and machinery involved really require a very high degree of protection, the demolition of non-reinforced work must be carried out and its place taken by reinforced structures such as these described in the Ministry of Home Security's Circular C.18."

The memorandum then gives comparative figures of the estimated current cost of work in London.

**33 NEW B.S.I. GOGGLES
SPECIFICATION**

The need for some sort of minimum standard for eye protection devices is evident from the number of unsatisfactory articles of equipment on the market. The British Standards Institution have issued a specification for spectacle type goggles used for protection against flying particles.

Curiously enough the publication makes no mention of safety-glass, the use of which is overwhelmingly more effective than the standards of strength laid down here. The establishment of generally agreed standards is to be welcomed and should be adhered to.

**34 NEW HOSE MAY
REVOLUTIONISE FIRE
FIGHTING**

A new type of hose, 11 inches in diameter, as opposed to the standard hose of 3½ inches, has been tried out in London recently. It can project eight times as much water as the ordinary hose.

Home Office experts saw the new hose in operation, and there is every hope for the success of experiments which are now being carried out on the apparatus.

Should the experiments prove successful the new hose will revolutionise fire fighting, for one hose will be capable of doing the work of several sets of standard hose.

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●Readers are invited to make use of this valuable information. The name and address of the manufacturer of any product described may be had on application to the Editor, BUSINESS, Whitefriars House, Tallis Street, London, E.C.4. To simplify your request you may refer to the items by number only.

●Manufacturers and distributors are invited to send complete information about their new products for inclusion in this feature.

**35 STATIC-DISSIPATOR FOR
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**36 SYNTHETIC RUBBER
SPONGE**

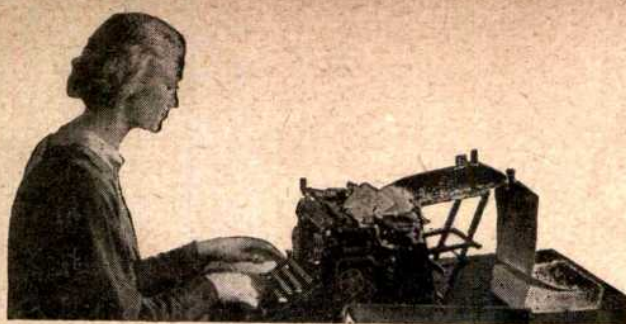
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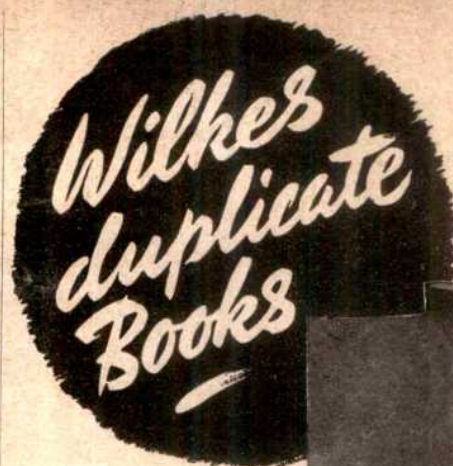
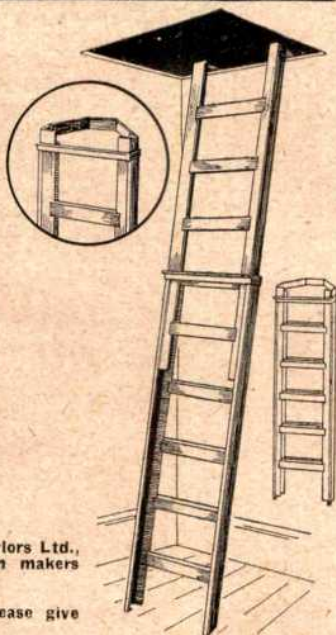
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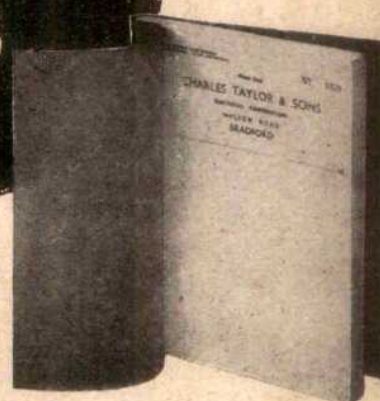
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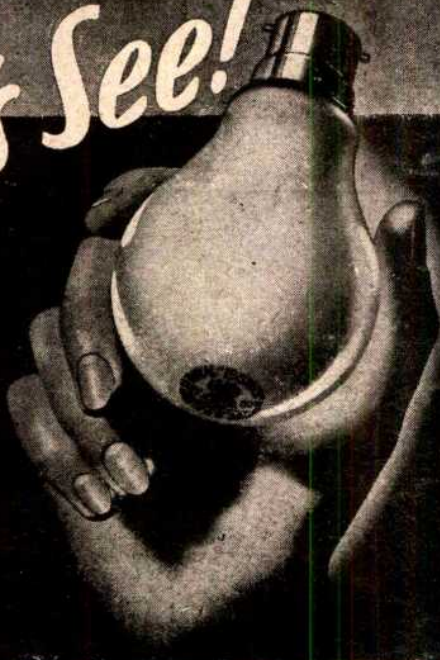
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ROYAL "EDISWAN" LAMPS

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(Continued from page 9).

area, but even for the provision of buses to and from the local town and its cinema. It is surprising that "better stock-keeping" should rank so low in the list but this was probably included in the item "better progress control" in many cases.

Among the additional ideas suggested is "closer inspection of work at every stage." If this avoids some of the maddening delays caused by rejection of "passed" work by Government inspectors, the increase in finished output may be considerable. Here again it is the training of the company's inspectors and viewers which is vital. But in many cases it is difficult to find someone who can really explain the decimal and metric systems so that girls can quickly become familiar with them. The art of teaching as well as knowledge of engineering or figures is called for here.

This survey may help some readers by showing where an ounce of extra directive effort may best be repaid. Latest practice for securing improved results in most of the directions indicated will be found scattered throughout this and previous issue.

Water Spray Screen Foils Gas Attacks

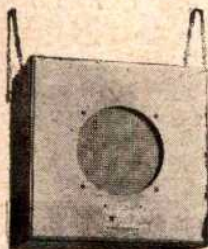
Councillor T. Ellis, of Hull, has been busy for many months perfecting a device which provides a water spray screen for buildings and thereby renders them gas proof.

The device is in the form of a patented brass nozzle which is fixed to water pipes fastened to the outer walls. The nozzles can be so manipulated that they produce a screening spray of water of whatever strength is desired.

They give a flat spray 15 feet in circumference, and buildings are thereby shrouded in a curtain of water which prevents poison gases from entering the windows or doors of the building.

Not only does it prevent gas from entering the building, but cleanses the walls at the same time, washing away any gas which may otherwise linger on the brickwork.

The water runs into the street drains and the work of the decontamination squads is half done. The nozzles work on a low water pressure and can be connected to ordinary household taps.



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INDUSTRIAL PRODUCTION EQUIPMENT

How to Plan Factory Canteen Meals

By Miss F. GARRETT,
Canteen Adviser Industrial
Welfare Society

PLANNING menus on a four week basis is the best method for most works' canteens as the quantities of cheese and jam, for example, can then be used more profitably.

The meat ration allows three meat meals a week. 1. A small portion of roast or boiled meat supplemented by other body building foods, e.g. oatmeal dumplings, pease pudding, a portion of peas or beans served as a third vegetable, or included in the stuffing. 2. An entree, such as steak pie (with kidney if possible). The amount available is below the required food value, and should have at least 1 oz. (dry weight) beans per portion added; these can be cooked and minced and used to thicken the gravy. 3. The third portion is usually a very small one, and made into a rechauffe dish with a little fresh mince added. Use some liver or offal if possible as this has excellent food value and even small amounts are useful and should be divided equally among the customers. Fat bacon, well rendered and crisp, can be added to the mince, and oatmeal should be used as well. A pudding containing a high percentage of milk should follow.

What to Do When the Meat Ration is Exhausted

If great care is exercised the fat ration allows fried fish and possible chips once a week, and this is always popular and worth trying to keep. Use oatmeal or wheat-meal crumbs for coating the fish, or use wheatmeal flour in the batter.

The fat ration is, I think, the most difficult to stretch, and full advantage should be taken of any additions such as dripping and fat American bacon. If a meal contains a proportion of fat, the body is sustained for longer, because fat is slowly digested.

On the fifth day another fish dish can be served two or three times a month, and oily fish such as herrings or tinned salmon should be chosen, or a proportion included with the white fish in a fish cake or pie. Vegetable flan, pastry made with wheat meal flour and some grated raw potato is another suggestion. The filling should contain plenty of pulse vegetables, and, if available, scraps of minced bacon or meat, and be served with a meat flavoured gravy. A pudding containing milk should follow.

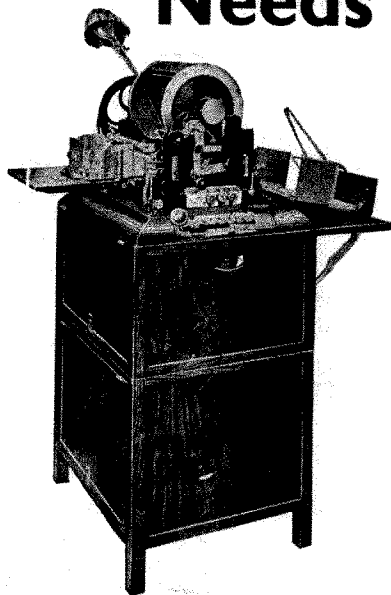
Sugar looks like the biggest difficulty, because so many people miss it, and are hard to convince that it is not an essential food. The allowance would only make two decent puddings a week. A third could be made with the ration of jam or syrup, probably diluted with cornflour sauce to eke it out. When obtainable, sugar substitutes could be used, the best method being to use half sugar (to give bulk and energy value) and half substitute (which sweetens only). Sometimes work-people would consent to having tea and beverages served without sugar, and this

gives the cook an extra supply for cooking. Carrots and marrow are useful for adding to stewed fruit, they help to sweeten and give bulk. Semolina (not often a favourite) has good food value and should be used to thicken fruit juices for flans and purees.

Soup, and maybe dumplings, could be served as part of war-time food, and should include plenty of root, pulse and green vegetables (including tough outer leaves) and be made with potato or greens water. Grated raw carrot, chopped parsley and watercress could be added just before serving.

Providing breakfasts is a problem experienced by many firms. An existing works canteen is entitled to a ration of bacon (1 lb. for 28 breakfasts) where breakfasts have to be served.

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Ellams Carbon Papers achieved popularity some forty years ago because they were the first Carbon Papers in the World to be clean to handle and smudgeless in operation.

To-day these things are taken for granted and the outstanding attribute which causes so many users to insist on Ellams Carbons is Economy—NOT cheapness in first cost but Long Life; you can use them time and time again. They will still be giving good service when two or even three lots of Carbons of lesser quality (although not greatly less in price) have had their day.

Write for full information.

Ellams

DUPLICATOR CO. LTD.

ASTOR HOUSE, ALDWYCH,
LONDON, W.C.2

Phone: Holb. 5365.

MAKERS OF BRITISH DUPLICATING EQUIPMENT FOR 50 YEARS.

GIVE WORKERS THE BENEFIT OF DAYLIGHT

IN offices and in factories and workshops which are not working at night, it is worth while taking down the whole of the blackout fixtures to give workers the benefit of the utmost daylight.

To leave up the fixed part to save the labour of taking it down is false economy.

We regret that, owing to a printer's error, the illustration in the advertisement of the International Coin Counting Machine Co. Ltd., of College Road, Cheshunt, Herts., on page 27 of the November issue of BUSINESS, was printed upside down.



Read that cutting again. It's not the Government talking, asking for maximum output. It's the men. The men on the job . . . seeing the job dying away under their hands . . . protesting at the waste of time, of machines, of willing hands.

Saying, in another way, what Kardex has been preaching for years—that big output is by no means just a matter of big plant.

The vital element of control—control of materials, control of stock, control of assembly, control of man-power—determines the output of any unit.

With Kardex control no administrative defect can hinder the flow of production. Some few indefinable delays are unavoidable in war time. But the inescapable voice of Labour demands that there shall be no other stoppage. This is no time for idle machines . . . or for alibis.



Send for Brochures giving convincing details of our claims, to Dept. 356:

KARDEX VISIBLE CONTROL SYSTEMS

1 New Oxford Street, London, W.C.1

Tel.: CHAncery 8888.

GREENAWAY

AND

SON

BUILDING
CONTRACTORS
REINFORCED
CONCRETE

FORest Hill 2251/3

265a Lordship Lane, Dulwich, S.E.22

HOW TO KEEP MEN AT THEIR DESKS

(Continued from page 16)

ing a letter. Executive calls receive the right of way over other connections. If the person called is away from his desk a signal leaves an automatic memorandum of the call. On the executive type instrument the buzzer that signals incoming calls may be shut off and incoming calls indicated only by signals.

The ordinary, everyday use of interior and intercommunicating telephone systems of the dial type is too well-known and too obvious to need review. In their use there are many of the possibilities already mentioned. There must be space provided for the automatic switching equipment.

How the Telewriter Can Help by Accurate Reproduction

So much for the ubiquitous telephone. Closely allied to it are special type devices such as call bells, electric authorising systems, automatic production reporting systems, and others. Almost every special need has been provided for by the development of a special type of equipment for transmitting information.

Startlingly dramatic in its future possibilities is a device of general usefulness—teletype machine. The instrument itself is well known. In appearance and operation it is like a typewriter. Messages typed on one machine are accurately reproduced on any other machine that is connected.

Teletypewriters were first used for communication within a company over private—usually leased—wires. The head office of many companies was thus connected with the factory, or principal branch offices were connected. Within factories production departments are thus connected.

Conferences May Be Held by Telewriter

Conference circuits may be set up with the teletypewriter as with the telephone; information may be sent to several branch offices, customers, or other stations at once. Such conference service has been found useful in releasing price quotations, market reports, and similar data.

Before the study of communication equipment is completed it should include comparisons of costs between the various solutions of the problem. Such comparisons should be carefully studied. Some types of equipment bear only monthly service charges; other types are purchased outright. Estimates should be checked to see that rentals, tolls, service charges, maintenance and repair costs, interest and depreciation on investment, cost of space, and similar invisible items are included if appropriate, as well as the more obvious charges.

SAVE PAPER PAINTED SIGNS

Direct on poster
and van
sites



Windows
and Hoardings

- ★ . . . Easy to apply
- ★ . . . Brilliant effect
- ★ . . . Lasting Service
- ★ . . . Any Size or Colours

Thanks to "TRAPINEX" Paint Transfers (Patd.) Advertisers can now apply their advertisements direct on to poster and van sites, shop windows, mirrors, air-raid hoardings, etc. in brilliant relief colours which cannot fail to catch the eye of passers-by. The most effective and inexpensive means of maintaining brand goodwill. Idea for Export, saving freight charges and valuable cargo space—

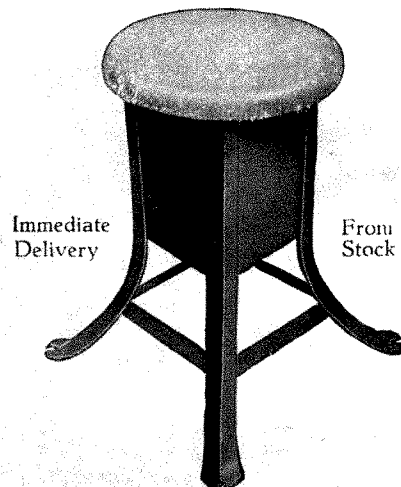
—and of course, for use in lieu of paper and metal labels on equipment.

WRITE OR PHONE FOR SPECIMENS—

**TRAPINEX LTD., 8 Commerce Works
43 Commerce Rd., London, N.22**

BOWES PARK 2689

FACTORY and WORKS SEATING



Immediate
Delivery

From
Stock

THE "KEMCLO" STOOL

as illustrated 13/- delivered;
18/6 with Back Rest.

Model 2—Extra large compartment and special seat 25/-.

Model 3—with Sponge Rubber Seat 30/-.

*ALL METAL CONSTRUCTION

*LOCKER COMPARTMENT UNDER SEAT (hinged to form cover).

*CAN BE CONSTRUCTED & MADE TO CUSTOMERS' OWN HEIGHTS & SUGGESTIONS.

'KEMCLO' HARDWARE Co.

55 Netherwood St., London, N.W.6.
MAIda Vale 1331.

Getting the Best from War-time Newspaper Advertising

FACED with drastic reductions in the volume of newsprint allowed for use in each issue, newspapers all over the country have in turn been forced to ration the space available for advertisements. In most cases a definite limit has been set to the size of advertisements accepted.

Some idea of the extent of this space rationing system may be gathered from the fact that few newspapers will now accept any advertisement larger than 11 in. across two columns, while many impose an even stricter limit of 8 in. across two columns.

To meet these new conditions advertisers have been compelled to adopt a new technique in preparing their copy. The principles of layout which were successful with large spaces can not, obviously, still be employed with spaces, the maximum of which was but a small fraction—often as little as one-tenth—of that customarily used in pre-war days.

Half-tone blocks, it has been found, have not the successful pulling power in small spaces they had in large ones. On the other hand, line blocks have been able to make up for what the half tone has lost and are being increasingly used for illustration purposes. That this particular point has been proved by long testing, will be seen from a cursory examination of the Saturday bargain advertisements in any National daily newspaper. The majority of these are illustrated but practically none of them use half-tone blocks for the purpose.

Possibly the most radical change is in the style of appeal. With large spaces, an advertiser was able to treat with as many as a dozen different lines in the one advertisement. Today's restricted spaces have led to one advertisement being used for one or, at the most, two lines. This, again has been proved by long usage in the same manner as the line block for small spaces.

VENUS

*Still the World's
Leading Quality
Pencils*

Owing to heavy demand for essential war industry, supplies are limited.

From 6B
softest
to 9H
hardest

VENUS PENCIL Co. Ltd., LONDON, E.5.

PHOTOCOPYING ★

*Speed up production
with less errors,
time & costs*

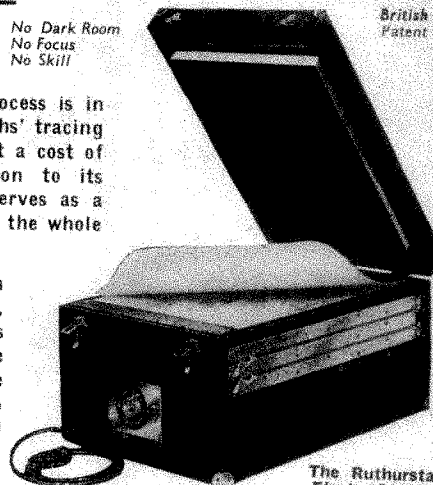
DRAWINGS - MAPS - BLUE PRINTS - DOCUMENTS CAN BE COPIED WITH THIS APPARATUS

The increasing demand necessitated by the War effort upon industry's personnel, applies in the first place to the Drawing Office. The Ruthurstat process is in certain factories reducing eighteen months' tracing of Engineers' Drawings to six weeks', at a cost of £1,500, as against £4,500. In addition to its importance to the Drawing Office, it serves as a general utility unit, interdependent with the whole organisation.

No Dark Room
No Focus
No Skill

British
Patent

The strain placed on executives in relation to Government Forms, Tenders, Contracts, etc. (which require many hours laborious typing and checking), can be relieved by the installation of the Ruthurstat process, which enables you to obtain exact errorless copies of vital documents.



The Ruthurstat
Electro-Copyist

RUTHURSTAT LTD.

12-13 ASTOR HOUSE

ALDWYCH - LONDON, W.C. 2

HOLBORN 4737

Full range of sizes from Office Models
to 42 in. X 32 in. Engineering Models

★ 10
hours typing
reduced to 30 minutes -
6 months tracing reduced to 2 weeks

Are you answering

LORD BEAVERBROOK'S appeal for WASTE PAPER?

WE CAN ARRANGE COLLECTION OF
ANY QUANTITY, AND PAY YOU THE

MAXIMUM CONTROLLED PRICES

JOHN HILL & CO. (Waste Paper) LTD.

Arlington Works, Arlington Road,

ST. MARGARETS, EAST TWICKENHAM, Middx.

Telephone: POPeogrove 5577 & 5157.

Also at Devizes Road, SWINDON, Wilts.

Telephone: SWIndon 3302.

And Roses Wharf, West Ferry Rd., MILLWALL, LONDON, E.14

Telephone: EAST 3421-2-3.

A flooring problem solved
thanks to



for
**CANTEENS
FACORIES
OFFICES, ETC.
ETC.**

We will gladly send an expert to discuss your canteen, factory, or office flooring problem . . . anywhere . . . any time. No obligation. Please write to:—

The Great Metropolitan Flooring Co. Ltd.
73, Kinnerton St. S.W.1. Sloane 0047 (7 lines)

**PITMAN'S FOR THE BEST
BOOKS ON BOOK-KEEPING**

**PITMAN'S for BOOKS
on MANAGEMENT**

**PITMAN BOOKS
mean EFFICIENCY**

AIR DEFENCE EQUIPMENT SERVICE

THE recognised experts and suppliers to Local Authorities and Government Priority Contractors throughout the Country, can supply your every requirement. Amongst our Specialities are D.T. and Leatherette Waterproof Coats from 25/- and Overalls from 15/11 in several types to meet all A.R.P. requirements.

**ALL ANTI-GAS REQUISITES
SUPPLIED**

Please send Enquiries to Head Office:
4 Lisle Street, London, W.C.2.
Telephone: GERRARD 2348-9.

Area Shop-Sales Are Becoming Stabilised

(Continued from page 26)

this is a poor result for so much effort. In fact it is a creditable performance. Had the energetic Captain Lyttleton remained in command at the Board of Trade, some of the industries would have been handled a good deal more drastically.

The danger now is that some of the small absorbed firms may not be able to regain their business after the war. Where it has retained its sales organisation, its future must depend on the business available, on the degree of sales and design ability possessed by the directors.

Urgent need is a concentration scheme for the insurance, banking and other service industries and for the wholesale and retail trades. Its arrival can only be a matter of time.

People are Trickling Back to Their City Homes

I mentioned last month that certain new trends in population and buying power were becoming evident up and down the country. Unhappily there is no question that more and more people are trickling in from the country to the cities, from the outer suburbs to the inner suburbs.

The chief exceptions are badly blitzed towns. In some of these the fall in population is surprising. But many manufacturers or their wholesalers seem to be unaware of it.

There is no reason for this, since their travellers are perfectly able to supply evidence from the shops.

The second new habit I mentioned, that of shopping at the nearest shop rather than at the biggest and most interesting shopping centre seems to be nation wide. Both at Bristol and Edinburgh there is evidence that the housewife is shopping less at the central city shops, more in her own suburb. Evidence is available in the fall of ration books for the city areas.

Even Government Departments are Learning to Save Paper

There is an interesting paragraph in the twenty-first report of the Select Committee on National Expenditure which shows that at least efforts are being made to reduce red tape, to co-ordinate orders, to reduce forms.

I cannot refrain from quoting this grave statement . . .

The Ministry of Supply has discontinued twenty forms, decided to call for fourteen less frequently and has simplified six.

The doctor does take his own medicine—but why not the full dose?

CLASSIFIED ADVERTISEMENTS

RATE—2/6 a line (average 7 words to a line). Minimum 3 lines costing 7/6; each additional line or part of a line 2/6. Box No. counts as one line and is to be paid for; replies are forwarded free of charge; 25% discount for 3 insertions, 5% for 6, 10% for 12. Payment with order for single insertion.

MISCELLANEOUS

The Proprietors of Letters Patents Nos. 351,276; 413,205; 431,623 and 431,627 relating to calculating and multiplying machines desire to grant licences under the Patents to interested parties on reasonable terms for the purpose of exploiting the same and ensuring its full commercial development and practical working in this country. Enquiries to be addressed to Cruikshank and Fairweather, 29 Southampton Buildings, London, W.C.2.

The Proprietors of Letters Patents Nos. 493,792 and 493,638 relating to cash registers, adding or accounting machines, or like calculating apparatus desire to grant licences under the Patents to interested parties on reasonable terms for the purpose of exploiting the same and ensuring its full commercial development and practical working in this country. Enquiries to be addressed to Cruikshank and Fairweather, 29 Southampton Buildings, London, W.C.2.

OFFICE EQUIPMENT FOR SALE

"A Large Selection of Ex-Government and OTHER STEEL AND WOOD OFFICE FURNITURE, INCLUDING FILING CABINETS, DESKS, CARD INDEX CABINETS, ETC. ALSO PLAN CABINETS, NEW AND SECONDHAND, AT LOWEST PRICES.—WRITE FOR CATALOGUE, THE MISCELLANEOUS TRADING CO., LTD., 134/5 HIGH HOLBORN, W.C.1. HOLBORN 4894."

Roneo Addressing Machine (model 40) good condition, hardly used. Stencil files, stencils and cards. £12 lot. Apply Baker, Midworth Street, Mansfield.

TIME RECORDERS

Staff Time Checking and Job Costing Time Recorders (all makes) for quick cash sale, exceptional condition.—Write "Betacool," Box 345, BUSINESS, Whitefriars House, Tallis Street, E.C.4.

WANTED

Office Furniture and Safes urgently wanted. Good prices paid. Send description **DALE**, 113 High Holborn, London, W.C.2. Tel. HOLBORN 2564.

Comptometer wanted. Must be in first class condition. Box 527, c/o BUSINESS, Whitefriars House, Tallis Street, E.C.4.

Second-hand McCaskey Register for 220 a/cs. Style 146 preferred. Must be in good condition. Heath Bros., Frensham, Surrey. Phone 50.

IT'S THE LEAST YOU CAN DO—

Give One Penny each week
to help the **RED CROSS**
care for the wounded.

● Start a 'Penny-a-week' scheme where you work. Send a postcard to the Lord Mayor of London, Mansion House, E.C.4, for full details. Red Cross thanks this Journal for the free gift of this announcement.

MONTREAL
TORONTO
WINNIPEG

GIBBONS KNOWS CANADA
J. J. GIBBONS LIMITED · ADVERTISING AGENTS

REGINA
CALGARY
EDMONTON
VANCOUVER

ABSENTEEISM DUE TO COLDS & 'FLU

STOP THAT MAN'S ONCOMING COLD AT ONCE
and you will:—

- 1 ensure that it does not become a 'heavy' Cold or develop into 'Flu'—which would certainly make him an "illness absentee".
- 2 prevent him acting as a source of infection to his fellow workers—increasing the likelihood of an epidemic in the factory.

This method of checking early infection succeeds in 90% of cases

TO reduce absenteeism through Winter Colds, 'Flu, etc., to a minimum among factory staff, it is necessary to supplement general preventive measures by adopting prompt and really effective treatment for all individuals who develop the first symptoms of a Cold or Influenza.

Such a method is now available in the well-known 'Two-Way' Treatment with T.C.P. Antiseptic. Experience in large Works over several Winters has shown that this treatment, if given promptly, will check a Cold or early Influenza in approximately 90% of cases. What is equally important, the patient can come to work next day with very little risk of infecting others.

Details of the T.C.P. 'Two-Way' Treatment are given on the right. Its effectiveness is due to its combined action, first as a powerful and penetrating germicide in the nose and throat, second, as an absolutely safe internal antiseptic. This means that T.C.P. not only clears up the local symptoms

of a Cold, but it also helps the whole system to throw off the toxins that cause feverishness, headache, and general Influenza symptoms.

The success of this technique depends, of course, on members of the staff reporting at once to the First-Aid Room, immediately they develop any signs of a Cold or 'throat'. The fact that many employees are already familiar with the use of T.C.P. for Colds, makes it easier to obtain their active co-operation both in reporting and also in continuing the treatment at home.

To emphasise the importance of this prompt reporting, the manufacturers of T.C.P. have prepared a series of posters for use in factories. Supplies of these posters are available, free of charge, to all firms intending to use the T.C.P. method. Samples of this material and prices of T.C.P. Antiseptic in bulk sizes, will gladly be sent, on application to BRITISH ALKALOIDS LTD., 69, Old Broad Street, London, E.C.2.

THE METHOD:—

- 1 All employees are instructed to report at the First-Aid Room immediately they develop any symptoms of a Sore Throat, Cold, Chill or 'Flu. **This is essential to the success of the method.**
- 2 Each man or woman thus reporting is then given the well-known 'Two-Way' Treatment with T.C.P. Antiseptic. This consists of a thorough throat spraying (or alternatively a gargle) with T.C.P. Antiseptic. Following this, an internal dose is given of 2 teaspoonsful of T.C.P. in one ounce of water.
- 3 The employee is instructed to report again at the First-Aid Room for a further treatment before leaving at night, and is encouraged to repeat the gargle and internal dose at home, before going to bed.

T.C.P.

Regd.

THE MODERN 'TWO-WAY' TREATMENT FOR RESPIRATORY INFECTIONS

TAYLORS FOR ALL TYPEWRITERS MAKES OF

Adding Machines, Duplicators, Cash Registers, Calculators, Time Recorders,
and All Business Appliances BOUGHT AND SOLD, HIRED AND REPAIRED

SAVE TIME—HIRE AN ADDER FOR STOCKTAKING

ADDOGRAPH

The Simplest Portable Adding, Listing
Machine
Delightful to use.



8 col. to add from 1d. to £9,999 19s. 11½d.
9 col. to add from 1d. to £99,999 19s. 11½d.
Hand and electric models with or without
subtraction and wide paper carriages.
No Modern Office can afford to be without one.

**NO MORE ERRORS—JUST USE THE
GUARANTEED ADDOMETER**

Rapid Automatic Addition and Subtraction.
Rests flat on the books. For Decimal or
Ordinary Figures and Feet and Inches, etc.

FOR POCKET OR DESK.

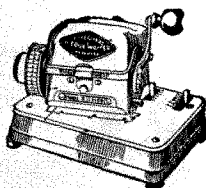
So Simple Anyone can use it.



In Plush-lined, ducoid case.

Size. 11½ × 2¼ × ½ in., 95/- post free.

When ordering state for what purpose
required. Also a cheaper pocket Adder for
ordinary figures and Indian money, in case.
30/- post free.



**ELIMINATE LOSS AND FRAUD BY
USING A "SAFEGUARD" THE BEST
CHEQUE PROTECTOR**

Used by leading Banks and firms. Do you
realise that an altered cheque is your own
liability? Price £12 12s.

All makes of Cheque Writers at half usual
prices. Ask for list.

**HIGHEST PRICES PAID for all
Makes of Modern**

Office Machinery:

**Adders,
Calculators,
Cashiers,
Addressers,
Duplicators,
Typewriters,
Steel Safes
and Furniture**



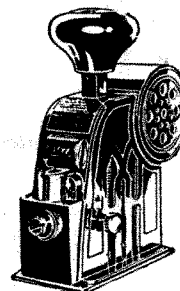
**MAIL OPENED
IN QUARTER
-TIME**

Busy office, no torn cheques, etc. £2 2s.
post free.

Bargains in

**VISIBLE INDEX
SYSTEMS**

Ask for Sizes and Capacities



WANTED

for

NATIONAL SERVICE

**Turn Your
SURPLUS
OFFICE EQUIPMENT
INTO CASH**

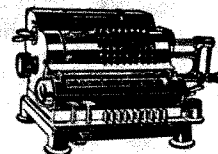
and

Help the War Effort

**USE ORDINARY STAMPS &
SAVE 80% IN POSTING TIME**

And let your business-getting letters look
like personal letters with actual postage
stamps by using the **TAPPIT** stamp affixer.
Cheaper and quicker than a post marker,
all stamps fixed, checked and counted in
one operation. British made and guaranteed.

**ROTARY CALCULATORS
ALL MAKES**



For all calculations. Multiplies, divides,
adds and subtracts in 1/10th time taken to
do so mentally.

Phone: Holborn 3793, or write

TEMPORARY TYPISTS SENT OUT.

TAYLORS TYPEWRITER MARKET

**74 CHANCERY LANE (Holborn End),
& at Maidenhead. London, W.C.2**